Vol. 1072 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

November 25, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 25, 1986 Volume 1072 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1072 OG 24
Notice of Maintenance Fees Payable	1072 OG 24
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1072 OG 24
Reissue Applications Filed	1072 OG 25
Requests for Reexaminations Filed	1072 OG 25
Service by Publication	1072 OG 25
Registration to Practice	1072 OG 26
Adverse Decisions in Interference	1072 OG 26
PTO Status	1072 OG 27
Update of the Status of PTO Services For October 1986	1072 OG 29
Patent Certificates of Correction	1072 OG 71
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1072 OG 72
Condition of Patent Applications	1072 OG 73
Reexaminations	1343
Reissue Patents Granted (32,292)	1347
Plant Patents Granted (5,808)	1349
Patents Granted	
General and Mechanical (4,624,015)	1351
Chemical (4,624,675)	1587
Electrical (4,625,070)	1695
Design Patents Granted (286,820)	1787
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 49
Classification of	
Patents (Including Reissues and Reexaminations)	PI 53
Designs and Plants	PI 56
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 57
Designs and Plants	PI 58
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
if paid before Nov. 1, 1986	930.00
if paid on or after Nov. 1, 1986	1015.00
International fees	
Basic fee (first 30 pages):	
if paid beofre Nov. 1, 1986	375.00
if paid on or after Nov. 1, 1986	430.00
Basic Supplemental fee (for each page over 30):	
if paid before Nov. 1, 1986	7.00
if paid on or after Nov. 1, 1986	8.00
Designation fee for the first 10 national or regional offices:	
if paid before Nov. 1, 1986	90.00
if paid on or after Nov. 1, 1986	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 22, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,416,025 through 4,417,358
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge

are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 7, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 31,461	06/426,751	12/13/83
(4,347,653)	(06/246,805)	(9/7/82)
4,347,639	06/253,604	9/7/82
4,347,665	06/262,457	9/7/82
4,347,675	06/232,835	9/7/82
4,347,678	06/225,318	9/7/82
4,347,696	06/245,747	9/7/82
4,347,766	06/242,820	9/7/82
4,347,767	06/222,780	9/7/82
4,347,774	06/277,336	9/7/82
4,347,809	06/239,620	9/7/82
4,347,827	06/269,149	9/7/82
4,347,853	06/236,648	9/7/82
4,347,893	06/251,583	9/7/82
4,347,901	06/232,740	9/7/82
4,347,914	06/286,870	9/7/82
4,347,943	06/254,057	9/7/82
4,347,956	06/226,465	9/7/82
4,347,961	06/236,702	9/7/82
4,348,028	06/233,160	9/7/82
4,348,056	06/224,651	9/7/82
4,348,103	06/282,920	9/7/82
4,348,127	06/287,096	9/7/82
4,348,136	06/225,326	9/7/82
4,348,167	06/228,098	9/7/82
4,348,179	06/259,379	9/7/82
4,348,204	06/249,955	9/7/82
4,348,299	06/318,149	9/7/82
4,348,322	06/242,529	9/7/82
4,348,323	06/226,289	9/7/82
4,348,325	06/248,178	9/7/82
4,348,333	06/310,406	9/7/82
4,348,342	06/234,020	9/7/82
4,348,347	06/258,120	9/7/82
4,348,357	06/215,597	9/7/82
4,348,361	06/264,308	9/7/82
4,348,371	06/260,641	9/7/82
4,348,372	06/260,653	9/7/82
4,348,397	06/246,661	9/7/82
4,348,405	06/293,805	9/7/82
4,348,411	06/272,858	9/7/82
4,348,414	06/252,527	9/7/82
4,348,452	06/242,647	9/7/82
4,348,485	06/241,101	9/7/82
4,348,487	06/317,358	9/7/82
4,348,488	06/300,311	9/7/82
4,348,496	06/228,453	9/7/82
4,348,508	06/277,175	9/7/82
4,348,528	06/282,903	9/7/82
4,348,545	06/229,262	9/7/82
4,348,556	06/248,975	9/7/82
4,348,562	06/226,367	9/7/82
4,348,572	06/246,812	9/7/82
4,348,607	06/239,168	9/7/82
4,348,616	06/229,213	9/7/82
4,348,628	06/312,427	9/7/82
4,348,680	06/228,558	9/7/82
4,348,683	06/293,392	9/7/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

Re. 28,860, Re. S.N. 918,195, Filed Oct. 14, 1986, Cl. 175/9, CURVED OFFSHORE WELL CONDUCTORS, Peter W. Marshall, et al., Owner of Record: *Shell Oil Co., New York, N.Y.,* Attorney or Agent: Fredrik Marlowe, et al., Ex. Gp.: 356

4,475,910, Re. S.N. 917,145, Filed Oct. 9, 1986, Cl. 604/352, MALE CONDOM CATHETER HAVING ADHESIVE ON ROLLED PORTION, Anthony J. Conway, et al., Owner of Record: *Arcon Corp., Stewartville, Minn.,* Attorney or Agent: Frederick E. Lange, et al., Ex. Gp.: 336

4,490,421, Re. S.N. 914,108, Filed Oct. 1, 1986, Cl. 428/35, BALLOON AND MANUFACTURE THEREOF, Stanley B. Levy, Owner of Record: *E. I. Du Pont de Nemours and Co., Wilmington, Del.,* Attorney or Agent: Louis H. Rombach, Ex. Gp.: 156

4,493,596, Re. S.N. 913,532, Filed Sept. 30, 1986, Cl. 408/233, ROTARY MATERIAL REMOVING TOOL, Manfred Grunsky, et al., Owner of Record: *Inventor,* Attorney or Agent: Peter K. Kontler, et al., Ex. Gp.: 322

4,536,475, Re. S.N. 910,470, Filed Sept. 23, 1986, Cl. 43/172.3, PLANT VECTOR, David M. Anderson, Owner of Record: *Phytogen, Pasadena, Calif.,* Attorney or Agent: Jorge A. Goldstein, et al., Ex. Gp.: 127

4,548,151, Re. S.N. 837,183, Filed Mar. 7, 1986, Cl. 114/219, REPLACEABLE MARINE FENDER MECHANISM, James H. Files, et al., Owner of Record: *LaSalle Marine, Inc., Houston, Tex.,* Attorney or Agent: Guy E. Matthews, Ex. Gp.: 315

4,576,883, Re. S.N. 878,006, Filed June 24, 1986, Cl. 429/192, ELECTRODE CONSTRUCTION FOR SOLID STATE ELECTROCHEMICAL CELL, Henry F. Hope, et al., Owner of Record: *Inventor,* Attorney or Agent: Zachary T. Wobensmith, III, Ex. Gp.: 114

4,601,743, Re. S.N. 917,990, Filed Oct. 10, 1986, Cl. 65/162, GLASS FURNACE WITH HEAT SENSING MEANS, Douglas M. Canfield, Owner of Record: *Cass Solar Corp., Pomona, N.Y.,* Attorney or Agent: Herbert Dubno, Ex. Gp.: 133

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of default of such proceedings sent to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this

publication, judgment will be entered against registrant and said registration will be cancelled.

Potato Plus, Inc., Waco, Tex., Reg. No. 841,715 for the mark "POTATO PLUS", Canc. No. 15,660.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Benjamin Lindner, Inc., a.k.a. Force 10, Los Angeles, Calif., Reg. No. 1,160,093, for the mark, "FORCE-10" and design, Canc. No. 15.458.

Allen Abrams & Morton A. Rosen, Los Angeles, Calif., Reg. No. 833,479, for the mark "SNEEKY PETE'S", Canc. No. 15,515.

Plymouth Golf Ball Co., Plymouth Meeting, Pa., Reg. No. 895,898, for the mark "UNI-BALL", Canc. No. 15,691.

Mel Finerman Co., Inc., Tarzana, Calif., Reg. No. 613,258, for the mark "HONEY BUNCH", Canc. No. 15,721.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Trojan, Inc., Hyattsville, Md., Reg. No. 866,653, for the mark "TROJAN AND DESIGN", Canc. No. 15,256.

Emba-Kleen Corp., Somerville, Mass., Reg. No. 1,057,311, for the mark "GLASS MATE", Canc. No. 15,668.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applicaltions before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before Dec. 29, 1986:

Adee, John W., P.O. Box 3448, Woodmore Branch, Silver Spring, Md. 20901
Cassan, Lynn S., 700–130 Slater St., Ottawa, Ontario, Canada K1P 6E2
McClaine, Douglas, 142 Wise Rd., Butler, Pa. 16001
Shay, F. Barry, 2808 Nodhampton St., N.W., Washington, D.C. 20015
Siemens, Terrance L., 4108 Yerkes Pl., Annandale, Va. 22003
Tarnoff, David L., 1133 N. Vernon St., Arlington, Va. 22201

CAMERON WEIFFENBACH,
Oct. 30, 1986. *Director, Office of*
Enrollment and Discipline.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,986,871, John D. Blades and Jerome E. Jackson, CHARGED PARTICLE MODULATOR DEVICE AND IMPROVED IMAGING METHODS FOR USE THEREOF, Interference No. 100,392, decided Sept. 6, 1986, claims 1–4, 7–10 and 20.

Patent No. 4,218,189, George Pask, SEALING MEANS FOR BLADED ROTOR FOR A GAS TURBINE ENGINE, Interference No. 100,811, decided May 16, 1986, claims 1, 5, 6 and 7.

Patent No. 4,258,701, Bruce Shawn Buckley, SOLAR COLLECTOR PANEL, Interference No. 101,163, decided May 9, 1986, claims 1–14.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals
and Interferences.

Status of PTO Services

The following is an update of the status of PTO services for October 1986:

Service Item	FY 1987 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	23
Trademarks	30	37**
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	5 Hours
Window Coupons	5	2
Mail Coupons	12	7
Letter Orders	16	9
Date of oldest unfilled order		Oct. 17, 1986
Current Mail Date being processed		Oct. 10, 1986
Certified Copies:		
Trademark Registrations	21	29
Applications-As-Filed	17	12
File-Wrapper/Contents	N/A	10
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	30**
Filing Reg. Certificates	Issue Date	3 days Late
Assignments:		
Patents	20	19
Trademarks	20	18
Avg. Days from Issue Fee Payment to Issue Date	90–100	112***
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	99% on Issue Date
Trademark Copies Available	Issue Date	99% on Issue Date

* Unless otherwise noted.
** Tapes received late from contractor.
*** Interval from fee payment to issuance is increasing because of the budget cut which necessitated the printing of 4,000 fewer patents than originally planned in FY 86.

IMPROVEMENTS TO SERVICES

- *PTO Entering of Attorney Docket Number on Missing Part/Incomplete Notices* — In response to several requests from patent attorneys, the PTO is now entering the attorney docket number on the Notice of Incomplete Application and Notice to File Missing Parts of Application.

  The attorney docket number which will be entered on the Notice will be that which was submitted on the transmittal letter as filed with a new patent application. The number must be clearly identified as an "attorney docket number". This number will be entered by the PTO under the Title of Invention on the Notices.

  If the Office makes a mistake in recording the attorney docket number on the Notice of Incomplete Application or the Notice to File Missing Parts of Application, such mistake is not to be used by the attorney as cause for delay in response. Nor is the attorney to request that the Office correct the docket number prior to response to the Notice. The attorney can notify the Office in the response, but no change will be made by the Office until the Filing Receipt is issued.

  If the attorney wishes to change the attorney docket number from that which was entered on transmittal letter as filed, the request must be submitted through amendment, submitted to the Patent Examining Corp.

- *Trademark Search Library "New Unclassified Drawings"* — We are making new application drawings available for public inspection more quickly. Copies of new drawings are made available in the "New Unclassified Drawings Box" in the Trademark Search Library before classification and filing of the drawings. The copies are arranged by date and serial number and remain in the box for inspection until the originals have been classified and filed.

- *Requests for Color Copies of Utility Patents Having Color Drawing(s)* — As announced in the Official Gazette Notice published at 1070 O.G. 10 on Sept. 9, 1986, the Office will provide color copies of utility patents having color drawings upon receipt of a special request and fee. All requests for such copies must be submitted in the form of a letter. These special requests should be directed to:

  Mary Reed, Manager
  Public Service Center
  Office of Patent and Trademark Services
  U.S. Patent and Trademark Office
  Washington, D.C. 20231

The current cost for color copies is $7.50 per sheet of color drawing. All requests will be filled with a complete black and white copy of the patent and copies of the full number of color drawings associated with the patent. Example: A request for color copies of a utility patent with two sheets of color drawings would cost $16.50: $1.50 + ($7.50 × 2). Payment may be made by authorizing the charge to a deposit account or by check.

- *Information Contacts* — For your convenience and reference, updated Information Contacts — Subject Index is provided in this Notice.

- *Organizational Directory* — The Office has recently updated its in-house organizational telephone directory. The directory reflects the most recent office moves, changes in personnel and new telephone numbers. For your convenience and future reference, the directory is reprinted in this issue.

Nov. 4, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

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Mail Coupons	12	7
Letter Orders	16	9
Date of oldest unfilled order		October 17, 1986
Current Mail Date being processed		October 10, 1986
Certified Copies:		
Trademark Registrations	21	29
Applications-As-Filed	17	12
File-Wrapper/Contents	N/A	10
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	30**
Filing Reg. Certificates	Issue Date	3 Days Late
Assignments:		
Patents	20	19
Trademarks	20	18
Avg. Days from Issue Fee Payment to Issue Date	90-100	112***
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	99% on Issue Date
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- Trademark Search Library "New Unclassified Drawings "

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Mary Reed, Manager
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Washington, D.C. 20231

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November 4, 1986

Theresa A. Brelsford
Assistant Commissioner
for Administration

INFORMATION CONTACTS
SUBJECT INDEX

SECTIONS:

General
Patents
Patent Examining Groups Telephone Numbers
Trademarks
Trademark Law Offices Telephone Numbers

INFORMATION CONTACTS
SUBJECT INDEX
GENERAL

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Attorney's Roster	557-1728
Cashier's Window	
Patents and Trademarks	557-3230
T.S. Information Systems (CopiShare Cards)	557-0318
Congressional Liaison	557-1310
CopiShare (T.S. Information Systems)	557-2469
Deposit Accounts	
General Information	557-3227
Remittances	557-3227

Note: Please mail Deposit Account Remittances only to:

Patent and Trademark Office
P.O. Box 70541
Chicago, IL 60673

Drop Boxes

Department of Commerce
Main Entrance
14th and E Street, N.W.
Washington, D.C.

Patent and Trademark Office
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Note: (Hours 8:30 a.m. - 12:00 midnight
Monday - Friday)

Employment 557-3631

INFORMATION CONTACTS
SUBJECT INDEX
GENERAL

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Equal Employment Opportunity	557-1692
Fees	
Fee Rates	557-3054
Fee Receipts	557-3230
General Information	557-3158
Refunds	557-2983
File Information Unit (Formerly called Record Room)	557-1625
Information	
General	557-3080
Services ..... Public Service Center	557-5168
Journal of Patent Office Society (JPOS)	
Note: All questions should be addressed to: Box 2600 Arlington, Virginia 22202	
Official Gazette, Notices	557-3794
Official Gazette (Government Printing Office)	
Distribution	
Subscription Problems (Patents and Trademarks)	(202) 275-3054
Procurement	557-0014
Public Affairs	557-3341
Public Service Center	557-5168

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Addenda Sets, Sale of	
Changes in Classes	557-5103
Amendments	
General Information	557-3080
Specific Pending Applications	Appropriate Examining Group

Note: Rule 312 Amendments should be mailed to:

U. S. Patent and Trademark Office
Office of Publications
Query and Correspondence Branch
Crystal Plaza 2 Room-6C30
Washington, D.C. 20231

Applications	
Examination	Appropriate Examining Group
General Information	557-3256
PCT - General Information	557-2003
Post-Examination	557-3283
Pre-Examination	557-3254
Re-Examination - General Information	557-3831
Status Inquiry of Pending Applications	Appropriate Examining Group or 557-1625
Statutory Invention Registrations (SIR)	Group 220 557-4950
Assignments	
Changes Affecting Title of Pending Applications and Patented Files	557-3826
Attorney, Conduct of	557-2012
Attorney's Window	
(See Public Service Window)	

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
CASSIS (Classification and Search Support Information System)	
Access to Cassis, training and problem resolution	557-9686
Certificates of Correction	557-0708
Classification Definitions and Orders - (Sale Of)	557-5103
Classification of Published Patents	557-3951
Complaints (Services)	557-5168
Copies	
Abandoned File Histories	557-1625
Abstracts of Title	557-3826
Applications as filed (Also Abandoned and Patented) File Wrapper and Contents	557-1552
Certified Copies of any document (Except Assignments)	557-1552
Foreign Patents	557-3545
Patented File Histories	557-1625
Pending Patent Applications	557-1552
U.S. Patents	557-1552
Disclaimers	557-4282
Disclosure Document Program	557-3378
Duty of Disclosure Matters	557-8384
Files (Files Information Unit)	
Abandoned File Histories	557-1625
Patented File Histories	557-1625
Pending Patent Applications	557-1552
Filing Receipts	557-3256

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Forms	
Patents	557-3080
PCT	557-2003
Foreign Patents (References)	
Hours 8:45 a.m. - 5:00 p.m.	557-3545
Fraud (Patent Attorneys)	557-8384
Issue Fee	
Balance of Issue Fee Transmittals	557-3283
Issue Fee Receipt, Incorrect	557-3283
Issue Fee Receipt, Non-Receipt	557-3283
Lapse Notices	557-3283
Inspection of Patent Files	557-1625
Inventors	
Deceased	557-8384
Correction of Error in Joining Inventors	
Patents	557-4282
Applications — Appropriate Examiner or	557-8384
License (Request to file patent application abroad)	557-4956
Maintenance Fees	557-6945
Manual of Patent Classification	
General Information	557-5103
Index to	557-0400
Manual of Classification, Sale of	
Note: Address inquiries to: Mr. C. A. LaBarre, Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402	
Subclass Listing, Sale of	557-5103

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Manual of Patent Examining Procedure (MPEP)	557-3070
Master Classified File (MCF)	557-0400
Notice of Allowance	
Notice of Allowance, Incorrect	Appropriate Examining Group
Notice of Allowance, Lost	Appropriate Examining Group
Notice of Allowance, Non-Receipt	Appropriate Examining Group
Notices of Appeal	
Board of Patent Appeals and Interferences	557-4101
Court of Appeals for the Federal Circuit (CAFC)	557-4035
Official Searches	557-9690
Patent Depository Library Program	557-9686
Patent Index	
To Use the Index	557-3951
Index Support	557-5103
Patent Term Extension	557-3920
Patented Files	
(See Files)	
PCT (Patent Cooperation Treaty)	557-2003
Petitions	
Abandonment, Holding of invoking supervisory authority of the Commissioner	Appropriate Examining Group Director
Amendment After Notice of Appeal	Examiner of Record
With Notice of Appeal	Examiner of Record
Refusal to Enter an Amendment invoking supervisory authority of the Commissioner	Appropriate Examining Group Director

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Petitions (Continued)	
Refusal to enter an amendment after allowance invoking supervisory authority of the Commissioner	Appropriate Examining Group Director
Appeals, Reinstate dismissed by group appeals clerk	Appropriate Examining Group Director
Application	
Acceptance of application filed by other than inventor	557-8384
Access to	Assistant Commissioner for Patents 557-8384
Concerning Appealed Application before transfer of jurisdiction to Board of Patent Appeals and Interferences	Appropriate Examining Group Director
Assignments and Issuance of Patents	Deputy Assistant Commissioner for Patents 557-4282
Attorney, Withdrawal of	Deputy Assistant Commissioner for Patents 557-4282
Cancel "new matter", Requirement to from specification, invoking supervisory authority of the Commissioner	Appropriate Examining Group Director
Certificates of Correction, Refusal to Issue	Deputy Assistant Commissioner for Patents 557-4282
Concurrent ex parte and inter partes prosecution	Appropriate Examining Group Director
Disclaimers, relating to	Deputy Assistant Commissioner for Patents 557-4282

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Petitions (Continued)	
Divisional reissue	Special Assistant to A/C for Patents 557-3054
Examiner's statement on petition	Appropriate Examining Group Director
Exception to undertakings under 37 CFR 1.341(g) (re former examiners)	Committee on Enrollment 557-1728
Ex parte questions in cases before the CAFC	Solicitor 557-4035
Express abandonment after notice of allowance	Deputy Assistant Commissioner for Patents 557-4282
Expunge Papers	Assistant Commissioner for Patents 557-8384
Extensions of Time	
Extension of Time to File Amendment relating to rejection of claim(s) by Board of Patent Appeals and Interferences	Board of Patent Appeals and Interferences 557-4101
Extensions of time in court matters	Solicitor 557-4035
Extensions of time during examination in group	Appropriate Examining Group
Extention of time to file a supplemental reply brief	Board of Patent Appeals and Interferences 557-4101
First request for extension of time to appeal to the CAFC or commence a civil action	Clerk, Board of Patent Appeals and Interferences 557-4101

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Petitions (Continued)	
First request for one-month extension to file appeal or reply brief in appeals to Board of Patent Appeals and Interferences	Appropriate Examining Group Director
Filing Date	Special Assistant to A/C for Patents 557-3054
Final Decision of Examiner, From requiring restriction	Appropriate Examining Group Director
Final Rejection, Premature invoking supervisory authority of the Commissioner	Appropriate Examining Group Director
Formal Sufficiency and Propriety of affidavits, invoking supervisory authority of the Commissioner	Appropriate Examining Group Director
Interferences	
Patent Interferences, Access to applications	Board of Patent Appeals and Interferences 557-4007
Patent Interferences, Access to unopened preliminary statements	Board of Patent Appeals and Interferences 557-4007
Patent Interferences, From Action by a primary examiner or an interlocutory action	Board of Patent Appeals and Interferences 557-4007
Patent Interferences, Late settlement papers	Board of Patent Appeals and Interferences 557-4007
Patent Interferences, Priority papers in patent application	Board of Patent Appeals and Interferences 557-4007

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Petitions (Continued)	
Interferences (Continued)	
Institute an Interference, Invoking supervisory authority of the Commissioner	Appropriate Examining Group Director
Interview with the examiner after application sent to issue	Appropriate Examining Group Director
Issuance, Defer	Deputy Assistant Commissioner for Patents 557-4282
Late Payment Of Issue Fee	Deputy Assistant Commissioner for Patents 557-4282
Of Additional Issue Fee	Deputy Assistant Commissioner for Patents 557-4282
License to File in Foreign Countries	Director, Group 220 557-2895
Limited Recognition to Prosecute specified application(s)	Committee on Enrollment 557-1728
Make Special Propective manufacture, Infringement, Inability to interest capital	Assistant Commissioner for Patents 557-3811
Make Special within jurisdiction of Board of Patent Appeals and Interferences	Board of Patent Appeals and Interferences 557-4101
Make Special Applicant's age or health, Division, Continuation or Continuation-in-part of earlier application, Environmental Quality Program, Special Examining Procedure (accelerated examination), Energy Program, Recombinant DNA	Appropriate Examining Group Director

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Petitions (Continued)	
Original oaths, Return of	Appropriate Examining Group Director
Priority Papers, Late	Deputy Assistant Commissioner for Patents 557-4282
Prosecution, reopen after decision by Board of Patent Appeals and Interferences	Appropriate Examining Group Director
Public Use Proceedings	Assistant Commissioner for Patents 557-8384
Reconsideration of Decision on motion	Appropriate Primary Examiner
Registration to Practice Before the PTO in patent cases	Enrollment and Discipline 557-2012
Rehearing, reconsideration, or modification of Board decision	Board of Patent Appeals and Interferences 557-4101
Rejection, Final	Appropriate Examining Group Director
Restriction Requirement Holding	Appropriate Examining Group Director
Revive	
To Revive	Deputy Assistant Commissioner for Patents 557-4282
To Revive, Conditional	Deputy Assistant Commissioner for Patents 557-4282
Statutory Invention Registration (SIR)	Group 220 557-4950

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Petitions (Continued)	
Strike patent application	Assistant Commissioner for Patents 557-8384
Supervisory authority of Commissioner Invoke in matters concerning the Office of Administration	Deputy Assistant Commissioner for Patents 557-4282
Supervisory authority of Commissioner Invoke in matters within the responsibility of the Patent Examining Operation	Deputy Assistant Commissioner for Patents 557-4282
Suspension of Action Second or Subsequent	Appropriate Examining Group Director
Suspension of Rules Relating to the examining of patent applications	Deputy Assistant Commissioner for Patents 557-4282
Suspension of Rules Relating to patent examining not otherwise covered	Deputy Assistant Commissioner for Patents 557-4282
Suspension of Rules in Patent matters administered by the Office of Administration	Deputy Assistant Commissioner for Patents 557-4282
Withdraw From Issue	Deputy Assistant Commissioner for Patents 557-4282
Protests Patent	557-8384
Public Service Window (Formerly called Attorney's Window - Pick Up Copies)	557-3480

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Record Room (Patents and Abandoned Files) (See File Information Unit)	
Reexaminations	
General Questions	557-3831
Reexamination Examiners	Appropriate Examining Group
Reexamination Pre-processing	557-3831
Reissues	Appropriate Examining Group
Return Receipt Post Cards	557-3232
Search Room, Assignments	
Hours 8:45 a.m. - 4:45 p.m.	557-3826
Search Room, Public Patent	
Reference to Patent and Indices	557-2276
High-Ceiling Area, Hours 8:00 a.m. - 6:00 p.m.	
Low-Ceiling Area, Hours 8:00 a.m. - 8:00 p.m.	
Secrecy Orders	557-4954
Statutory Invention Registration (SIR)	
General Questions	557-8384
SIR Examiners	557-4950
Subclass Data File (SDF)	557-0400
Subclass Listings	557-5103
Terminal Disclaimers	557-0709

INFORMATION CONTACTS
SUBJECT INDEX
PATENTS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT

Telephone Numbers, Patent Examining Groups

Chemical Examining Groups

Group 110	557-2517
Group 120	557-3920
Group 130	557-2475
Group 150	557-6535

Electrical Examining Groups

Group 210	557-5080
Group 220/290	557-2895
Group 230	557-2878
Group 240	557-2900
Group 250	557-3311
Group 260	557-3321

Mechanical Examining Groups

Group 310	557-3618
Group 320	557-3694
Group 330	557-3125
Group 340	557-3128
Group 350	557-6200

INFORMATION CONTACTS
SUBJECT INDEX
TRADEMARKS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Affidavits	
Of Use (Section 8)	Post Registration Team 557-1986
Of Incontestability (Section 15)	Post Registration Team 557-1986
Correction to Registration (Section 7)	Post Registration Team 557-1986
Amendments	
After Publication or Allowance	Quality Review Clerk 557-5249
After Registration	Post Registration Team 557-1986
General Information	Public Service Center 557-5168
Specific Pending Application	Appropriate law Office
Appeal	
Final Refusal by Examining Attorney	557-3551
Applications	
Examination	Appropriate Law Office
General Information	Public Service Center 557-5168
Informal Applications	557-5255
Post Examination	557-1986
Power of Attorney re pending applications	Secretary of Appropriate Law Office
Pre Examination	557-5255
Status Inquiry of Pending Application	Trademark Services Division 557-5249
Status Inquiry of Registered Files	557-3282
Assignments	
Changes Affecting Title of Pending Application and Registered Files	Assignment Branch 557-3247

INFORMATION CONTACTS
SUBJECT INDEX
TRADEMARKS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Attorney's Window (See Public Service Window)	
Cancellations	
Cancellation of Registration	Trademark Trial and Appeal Board 557-3551
Voluntary Surrender of Registration	Post Registration Team 557-1986
Certificates of Correction	557-1986
Classification of Goods and Services	
Specific Application	Appropriate Law Office
General Information	557-3268
Complaints (Services)	557-5168
Concurrent Use Proceeding	Trademark Trial and Appeal Board 557-3551
Copies	
Abandoned File Histories	557-1625
Certificates of Non-Registration for Kuwait	557-3268
Certified Copies of Registrations	557-1986
Certified Copies of any Document (except trademark registration)	(202) 377-3359
Pending Application Files	557-1587
Printed Copies of Registration	(202) 377-2535
Registered Assignment File Histories	557-3826
Status Copies of Registration	557-1986
Title Records (for applications and registrations)	557-3826
Corrections	
Pending Applications	Appropriate Law Office
Registrations	557-1986

INFORMATION CONTACTS
SUBJECT INDEX
TRADEMARKS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Files	
Abandoned File Histories	557-1625
Pending Trademark Applications	Appropriate Law Office
Trademark Registrations	557-3281
Filing Receipts	
Corrections	557-5253
General and Specific Information	Trademark Services Division 557-5249
Forms, Trademark	557-3080
New Certificates	557-1986
Petitions	
Abandoned Application, to Revive	Director Trademark Examining Operation 557-3268
Application Special, To Make	Director Trademark Examining Operation 557-3268
All Other Trademark Petitions	Special Assistant to A/C for Trademarks 557-7464
Protests, Letter of	Director Trademark Examining Operation 557-3268
Public Service Window (Formerly called Attorney's Window - Pick Up Copies)	557-2833
Renewal, Registrations	557-1986
Return Receipt Post Cards	557-3232

INFORMATION CONTACTS
SUBJECT INDEX
TRADEMARKS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Search Library (reference to trademarks) Hours 8:00 a.m. - 5:30 p.m.	557-3281
Search Room Assignments Hours 8:30 a.m. - 4:45 p.m.	557-3826
Trademark Manual of Examining Procedures (TMEP)	557-3268

INFORMATION CONTACTS
SUBJECT INDEX
TRADEMARKS

AREA CODE (703) unless otherwise noted.

INQUIRY	CONTACT POINT
Telephone Numbers, Trademark Law Offices	
Law Office I	557-3273
Law Office II	557-3277
Law Office III	557-9560
Law Office IV	557-9550
Law Office V	557-5380
Law Office VI	557-3937
Law Office VII	557-5237
Law Office VIII	557-5242

ORGANIZATIONAL TELEPHONE DIRECTORY

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Assistant Secretary and Commissioner Donald J. Quigg rm 11E10 CP3..... 557-3071
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Assistant Commissioner for Finance & Planning Bradford R. Huther rm 11D27 CP3..... 557-1572
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Secretary Johnell McConnell rm 11C28 CP3..... 557-3065

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Secretary Olga M. Suarez rm 12C08 CG2..... 557-4048
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John W. Dewhirst rm 12C08 CG2..... 557-4034
Albin F. Drost rm 12C08 CG2..... 557-4034
Robert D. Edmonds rm 12C04 CG2..... 557-2282
John C. Martin rm 12C08 CG2..... 557-4034
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Richard E. Schafer rm 12C08 CG2..... 557-2282
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Paralegal Specialists
Kathleen D. Clopper rm 12C08 CG2..... 557-2282
Patricia D. McDermott rm 12C08 CG2..... 557-2266
Maryann B. Volkmar rm 12C08 CG2..... 557-4034
Legal Technicians
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Ravonne P. Lee rm 12C08 CG2..... 557-4034
Kimberly Dent rm 12C08 CG2..... 557-2282
Theresa Trierweiler-Cappo Law Library rm 12C08 CG2..... 557-4052

OFFICE OF ENROLLMENT AND DISCIPLINE

Director Cameron Weiffenbach rm 810 PK1 557-2012
Secretary Beverly F. Ross rm 810 PK1 557-2012
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Marian E. Ford rm 810 PK1 557-2012
Patricia M. Jordan rm 810 PK1 557-2012
Roster Information rm 810 PK1 557-1728

BOARD OF PATENT APPEALS AND INTERFERENCES

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Secretary Wanda Banks rm 10C01 CG2 557-4000

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James R. Boler rm 10C12 CG2 557-4000
Marc L. Caroff rm 10C04 CG2 557-4066
Irwin C. Cohen rm 925A CM2 557-5833
Jerry D. Craig rm 10D02 CG2 557-4058
Mary F. Downey rm 10B14 CG2 557-4065
Stephen J. Emery rm 12B10 CG2 557-4025
William L. Freeh rm 10B10 CG2 557-4067
Donald D. Forrer rm 10C16 CG2 557-4000
Melvin Goldstein rm 10D08 CG2 557-4057
John T. Goolkasian rm 10B06 CG2 557-4023
Paul J. Henon rm 10C22 CG2 557-4058
Edward C. Kimlin rm 12B08 CG2 557-4023
William F. Lindquist rm 10C18 CG2 557-4066
Charles N. Lovell rm 10D06 CG2 557-4070
William E. Lyddane rm 925A CM2 557-5833
Thomas E. Lynch rm 10B04 CG2 557-4061
Harrison E. McCandlish rm 10C10 CG2 557-4025
Edward J. Meros rm 10C20 CG2 557-4025
A. Donald Messenheimer rm 10D04 CG2 557-4064
Gordon K. Milestone rm 10A10 CG2 557-4057
Marion Parsons, Jr. rm 925A CM2 557-5832
Irving R. Pellman rm 10A16 CG2 557-4066
Verlin R. Pendegrass rm 10A08 CG2 557-4066
Alton D. Rollins rm 12B04 CG2 557-4023
James A. Seidleck rm 10A18 CG2 557-4070
Ronald H. Smith rm 10C08 CG2 557-4000
William F. Smith rm 10A06 CG2 557-4065
Michael Sofocleous rm 10C06 CG2 557-4000
Richard A. Spencer rm 10A12 CG2 557-4067
Robert F. Stahl rm 925A CM2 557-5832
Arthur J. Steiner rm 10A14 CG2 557-4062
Bruce H. Stoner, Jr., rm 12B06 CG2 557-4025
Brereton Sturtevant rm 10A22 CG2 557-4064
Henry W. Tarring, III, rm 10B02 CG2 557-4068
James D. Thomas rm 10A04 CG2 557-4101
Norman G. Torchin rm 10C02 CG2 557-4000
Stanley M. Urynowicz 10C14 CG2 557-4000
Sherman E. Winters rm 10B12 CG2 557-4068

Service Branch:
Chief Clerk of Board T. Maxine Duvall rm 10C09 CG2..... 557-4101
Deputy Clerk Nannie B. Henry rm 10C03 CG2..... 557-4100
Deputy Clerk Shirley A. Jefferys rm 10C09 CG2..... 557-4101
Deputy Clerk Eunice I. Price rm 10C09 CG2..... 557-4101
Ex parte Legal Clerk Groups 110-120
Eleanor Green rm 10C09 CG2..... 557-4107
Ex parte Legal Clerk Group 130
Laverne Smith rm 10C09 CG2..... 557-3100
Ex parte Legal Clerk Group 150
Donald Harris, Sr. rm 10C09 CG2..... 557-4108
Ex parte Legal Clerk Groups 210-220-230-240-250-260-290
Mary E. Thomas rm 10C09 CG2..... 557-4109
Ex Parte Legal Clerk Groups 310-320-330-340-350
Mabel Neal rm 10C09 CG2..... 557-4106
Inter Partes Legal Clerk
Olivia M. Duvall rm 10C01 CG2..... 557-4008
Inter Partes Legal Clerk
Yolunda R. Townes rm 10C01 CG2..... 557-4001

OFFICE OF QUALITY REVIEW
Director James D. Trammell rm 10A11 CP2..... 557-3564
Secretary Donna Purdham rm 10A11 CP2..... 557-3564

OFFICE OF ASSISTANT COMMISSIONER FOR PATENTS
Assistant Commissioner Rene D. Tegtmeyer rm 11A13 CP3..... 557-3811
Secretary Sherry D. Brinkley rm 11A13 CP3..... 557-3811
Special Assistant R. Franklin Burnett rm 11A13 CP3..... 557-3054
Secretary Donna E. Ellis rm 11A13 CP3..... 557-3054
Paralegal Specialist Francis Beane rm 11A13 CP3..... 557-3054
Manual of Patent Examining Procedure Editor Louis O. Maassel
rm 11A13 CP3..... 557-3070
Special Program Examination Unit rm 10D04 CP3..... 557-8384
Deputy Assistant Commissioner for Patents James E. Denny rm 11A09 CP3..... 557-4279
Secretary Darla Karn rm 11A09 CP3..... 557-4279
Patent Programs Administrator Michael Lynch rm 11A09 CP3..... 557-4279
Patent Policy and Resources Director Anne Kelly rm 11A0..... 557-4279
Petitions Examiner Bradley Garris rm 11A09 CP3..... 557-4282
Petitions Information rm 11C13 CP3..... 557-4282

Office of Patent Program and Documentation Control
Director Richard H. Rouck rm 10B04 CP3..... 557-4222
Secretary Jacqueline Goff rm 10B04 CP3..... 557-9182
Program Analyst Carolyn Arrington rm 10B08 CP3..... 557-9184
Patent Academy Joan Earyes rm 502 PK1 557-2086
Paper Correlating Office JoAnn Harris rm 10B09 CP3..... 557-5148
Margaret Seward rm 10B09 CP3..... 557-5149
Palm Coordinator Rolf G. Hille rm 10A01 CP3..... 557-9175
Automation Affairs Jay P. Lucas rm 1142 CP3..... 557-4211

PATENT DOCUMENTATION ORGANIZATIONS

Administrator for Documentation William S. Lawson rm 313 CM2..... 557-0400
Secretary Lynn W. Smith rm 313 CM2..... 557-0400
Data Base Administrator Philip K. Olson rm 313 CM2..... 557-0400
Patent Depository Library Program Manager Carole A. Shores rm 306 CM2.... 557-9686
Secretary Louis J. Timmons rm 306 CM2..... 557-9686
Office of Documentation Planning & Support Director Edward J. Earls rm 313 CM2..... 557-0400
Secretary Deborah Brasel rm 313 CM2..... 557-0400
Practices and System Analysis Staff George A. Chadwick III rm 313 CM2..... 557-0400
Documentation Practice & Systems Division (Acting) Director Frank L. Rytlewski rm 313 CM2..... 557-0400
Data Management Branch Alice B. Aderholt rm 306 CM2..... 557-5907
Information Resources Branch Geraldine Dozier rm 308 CM2..... 557-5103
Patent Index rm 308 CM2..... 557-3951
Documentation Projects Division Chiquita M. Clark rm 1240 CP6... 557-3393
New Document Processing Division Marcia A. Smith rm 344 CM2..... 557-5110
Preprocessing Branch Jerry Redmond rm 338 CM2..... 557-5016
Final Processing Branch Gail Lewis rm 340 CM2..... 557-5114
Special Processing Branch Gail Lewis (Acting) rm 344 CM2..... 557-5112
Weekly Issue Branch Natalie Jackson rm 300 CM2..... 557-5108

Chemical Classification Group Director Delmar Metheny rm 902 CM2..... 557-3815
Secretary Sandra P. Crawford rm 902 CM2..... 557-3815
Unit I Donald J. Hoffman rm 933 CM2..... 557-3505
Unit II Leslie Wolf rm 928 CM2..... 557-3528
Unit III Daniel M. Pritchett rm 905 CM2..... 557-3427

Electrical Classification Group Director Eugene E. Young rm 1D07 CS4..... 557-0117
Secretary Melvina M. Jarrett rm 1D06 CS4..... 557-0117
Unit I Gary G. Solyst rm 1E02 CS4..... 557-0157
Unit II Earl C. Folsom rm 1D11 CS4..... 557-0168
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Receipts and Records Section Beverly Brooks Suite 1821D CM2 557-0186

CHEMICAL EXAMINING GROUPS

110 General, Metallurgical, Inorganic, Petroleum and Electrical Chemistry, and Engineering rm 9C17 CP3 557-2517
Director Dennis E. Talbert rm 9D17 CP3 557-9600
Secretary Constance L. Morgan rm 9D19 CP3 557-9600
General Information/Receptionist rm 9C17 CP3 557-2517
SAC Dorothy Dawkins rm 9C17 CP3 557-3598

111 Metallurgy - alloys, process and apparatus; metal stock
L. Dewayne Rutledge rm 10E02 CP3 557-6722

112 Electro-chemical John F. Niebling rm 9B26 CP3 557-1217

113 Inorganic compounds and non-metallic elements (except radioactive); chemical gas purification processes; beneficiating ores; hydrometullurgy; magnetic and piezoelectric compositions John Doll rm 9A15 CP3 557-2517

114 Methods for semiconductor treating and manufacturing; batteries; photovoltaic cells and their methods of operation Brian E. Hearn rm 10D35 CP3 557-6728

116 Mineral oil processes and products, catalytic compositions and chemistry of hydrocarbon Andrew H. Metz rm 9D35 CP3 557-3029

118 Liquid and solid fuels, chemical and biological fertilizers, refractory and pigment compositions, lubricating compositions William R. Dixon, Jr. rm 9E06 CP3 557-6698

120 Organic Chemistry and Biotechnology rm 9C13 CP2..... 557-3920
Director Charles E. Van Horn rm 9A09 CP2..... 557-3637
Secretary Linda M. Feducia rm 9A09 CP2..... 557-3637
General Information/Receptionist rm 9C13 CP2..... 557-3920
SAC Kathryn Perry rm 9C13 CP2..... 557-3920
121 Heterocyclic organic chemistry Henry R. Jiles rm 9D01 CP2..... 557-3920
122 Nitrogen containing heterocyclic compounds, mercaptans and carbonate esters Donald G. Daus rm 8B32 CP2..... 557-3920
123 Peptides, carbohydrates, aromatic nitriles hetero-O and -S containing compounds, cosmetics, dentifrices, drug and pesticide carriers, and viral immunology Donald B. Moyer rm 8A15 CP2..... 557-3920
124 Nitrogen, heavy metal, silicon, halogen, acid/ester organic compounds Charles F. Warren rm 8D31 CP2..... 557-3920
125 Medicines, poisons, cosmetics, testing compositions, and molecular biology Albert T. Meyers rm 8B02 CP2..... 557-3920
126 Organic carboxylic acid and ester compounds, oxy, aldehyde and keto compounds, phosphorus acid compounds Natalie Trousof rm 9B32 CP2..... 557-3920
127 Molecular genetics, cell culture, catalysis, enzymology, microbiology and chemical engineering Thomas Wiseman rm 9D31 CP2..... 557-3920
128 Clinical chemistry, microbiology, immunology and enzymology, food technology, purification and chemical engineering Robert Warden rm 8D19 CP2..... 557-3920
129 Herbicides and heterocyclic chemistry Glennon H. Hollrah rm 9A01 CP2..... 557-3920

130 Specialized Chemical Industries and Chemical Engineering rm 8C17 CP3..... 557-2475
Director Robert F. White rm 8D19 CP3..... 557-3804
Secretary Vickie Enos rm 8D19 CP3..... 557-3804
General Information/Receptionist rm 8C17 CP3..... 557-2475
SAC Ruth Lyles rm 8C17 CP3..... 557-9854
131 Adhesive bonding and miscellaneous chemical manufacture Donald E. Czaja rm 7A01 CP3..... 557-2475
132 Food or edible material, processes, compositions and products Raymond Jones rm 8D01 CP3..... 557-2475
133 Paper making and fiber liberation; glass manufacture; concentrating evaporators, separatory distillation processes and apparatus; separating and assorting solids-froth floatation; and compositions, method and apparatus for etching in chemical manufacture S. Leon Bashore rm 7E02 CP3 .. 557-2475
134 Chemical apparatus such as analyzers, reactors and sterilizers; mineral oil freaters, fuel gas generators and coke ovens; processes of chemical analysis, sterilizing and preserving; fuel gas generation and thermolytic distillation of materials Barry S. Richman rm 9B02 CP3..... 557-2475
135 General molding or treating apparatus; static molds; gas separation; and gas and liquid contact Jay H. Woo rm 8D35 CP3..... 557-2475
136 Liquid purification or separation Richard V. Fisher rm 8B36 CP3..... 557-2475
137 Processes of plastic and nonmetallic article shaping or treating Jan H. Silbaugh rm 8A01 CP 3..... 557-2475

150 High Polymer Chemistry, Plastics, Coating, Photography, Stock Materials and Compositions rm 11C19 CP2..... 557-6525
Director James O. Thomas, Jr. rm 11A04 CP2..... 557-6533
Secretary Sharon C. Graham rm 11A04 CP2..... 557-6533
General Information/Receptionist rm 11C19 CP2..... 557-6525
SAC Ellen Scott rm 11C19 CP2..... 557-6525
151 Mixed synthetic resin compositions, block and graft copolymers and irradiation of polymers John Bleutge rm 11C19 CP2..... 557-6525
152 Coating processes and coating apparatus Norman Morgenstern rm 11C19 CP2..... 557-6525
153 Foams, condensation polymers of cellulose, phenols, isocyanates, polyesters, polyepoxides, stabilization of polymers John Knight, III rm 11C19 CP2 557-6525
154 Stock materials or miscellaneous articles of manufacture George Lesmes rm 11C19 CP2..... 557-6525
155 Polymer compositions, addition polymers, and carbohydrates Joseph Schofer rm 11C19 CP2..... 557-6525
156 Radiation imagery chemistry - process, composition or product, and stock materials or miscellaneous articles of manufacture John Kittle rm 11C19 CP2. 557-6525
157 Special utility compositions, coating compositions, dye compositions and processes, textile treating compositions, and abrasive compositions Paul Lieberman rm 10A10 CP2..... 557-6525

ELECTRICAL EXAMINING GROUPS

210 Industrial Electronics, Physics and Related Elements rm 9C17 CP4..... 557-5080
Director Gerald Goldberg rm 9D19 CP4..... 557-2488
Secretary Teresa E. Dugan rm 9D19 CP4..... 557-2488
General Information/Receptionist rm 9C17 CP4..... 557-5080
SAC Charles B. Blake rm 9C17 CP4..... 557-7405
211 Music, acoustics, mechanical registers, motion pictures, photography and photocopying L. Thomas Hix rm 9B40 CP4..... 557-7674
212 Motor-generator structure systems and industrial voltage regulation and conversion Patrick R. Salce rm 9A01 CP4..... 557-9695
214 Electrical switches, electrical transmission systems, electrical discharge devices, electrical furnaces and electrical devices A. David Pellinen rm 8B24 CP4..... 557-2885
215 Conductors, insulators, industors, electric photocopying and electrical devices Arthur Grimley rm 9E16 CP4..... 557-7671
216 Recorders, scales, magnets and magnetic and thermal switches Elliott A. Goldberg rm 8B02 CP4..... 557-2323
217 Motor control, horology, electrical music tone generation, prime-mover synamo plants, electrical elevator controls William M. Shoop, Jr. rm 9D01 CP4..... 557-3231

220/290 Utility and Design Applications rm 10C17 CP4..... 557-2895
Director Kenneth L. Cage rm 10D17 CP4..... 557-2877
Secretary Jo Morrow rm 10D19 CP4..... 557-2478
General Information/Receptionist (Group 220) rm 10C19 CP4..... 557-2895
General Information/Receptionist (Group 290) rm 2C32 CP3..... 557-2864
SAC Joanne Hodge (Acting) rm 10C17 CP4..... 557-4950
Licensing and Review Joanne Hodge (Acting) rm 10C34 CP4..... 557-4948
Mildred Lawrence rm 10C34 CP4 557-4949

221 Weapons (firearms, ordnance, ammunition, explosive devices), general lubrication, nuclear reactor systems, illumination, aeronautics and ships as well as all classified mechanical applications Deborah L. Kyle rm 10D01 CP4..... 557-3253

222 Radio, optic, acoustic, wave communications systems and all classified electrical applications Thomas H. Tarcza rm 10E16 CP4..... 557-4922

223 Chemical and including radioactive materials, powder metallurgy, rocket fuels, explosives and thermal and photoelectric batteries as well as all classified chemical applications John Terapane rm 10E02 CP4..... 557-4934

291 Ornamental designs in the area of industrial arts Wallace R. Burke rm 2C32 CP3..... 557-4979

292 Ornamental designs for fine arts Bernard Ansher rm 2C32 CP3..... 557-4965

230 Information Processing, Storage, and Retrieval rm 11C17 CP4..... 557-2878
Director Earl Levy rm 11D37 CP4..... 557-5088
Secretary Laura Dorsey rm 11D37 CP4..... 557-5088
General Information/Receptionist rm 11C17 CP4..... 557-2878
SAC Katherine A. Nelson rm 11C17 CP4..... 557-4174

232 General and special purpose data processing systems and digital arithmetic subsystems James D. Thomas rm 11B02 CP4..... 557-0375

233 Static information storage and retrieval, structural elements of dynamic magnetic information storage or retrieval and record controlled systems Stuart N. Hecker rm 11D01 CP4..... 557-0326

234 Ordnance or weapon system computers, code converters and special applications of computers including vehicle control, navigation, measuring, testing and monitoring Errol A. Krass rm 11B22 CP4..... 557-8055

235 Electrical dynamic information storage and retrieval Raymond F. Cardillo rm 11D17 CP4..... 557-4316

236 Computer control systems, miscellaneous applications of computers, computer aided product manufacturing, robotics, analog and hybrid computers, and error correction and detection systems Jerry Smith rm 11E10 CP4..... 557-8041

237 General and special purpose data processing systems, and speech analysis and synthesis Gareth D. Shaw rm 11B40 CP4..... 557-8047

240 Packages, Cleaning, Textiles and Geometrical Instruments rm 7C17 CP4..... 557-2900
Director Trygve M. Blix rm 7D19 CP4..... 557-2906
Secretary (Vacant) 7D19 CP4..... 557-2906
General Information/Receptionist rm 7C17 CP4..... 557-2900
SAC Doretha A. Bailey rm 7D23 CP4..... 557-4319
241 Packaging art including glass, fabric metal, wood, paper and plastic receptacles plus closures, therefor William I. Price rm 6B02 CP4..... 557-4719
242 Fluid treating, presses, food apparatus, cleaning, agitating, centrifuges, and web feeding Harvey C. Hornsby rm 7A15 CP4..... 557-4317
243 Conduits, bathroom facilities, cleaning apparatus, filling apparatus, switches, and article carriers Stephen Marcus rm 6B21 CP4..... 557-4156
245 Textiles, winding and reeling, pushing and pulling, bearings, and flexible torque transmitters Stuart S. Levy rm 7E16 CP4..... 557-3453
246 Measuring and testing, dynamic information storage or retrieval, optical image projectors and joint packing Charles E. Frankfort rm 6D15 CP4..... 557-3220
247 Textile and leather manufacture, apparel, and textiles Werner Schroeder rm 6D01 CP4..... 557-3302

250 Electronic and Optical Systems and Devices rm 8D17 CP4..... 557-3311
Director Edward Kubasiewicz rm 8D19 CP4..... 557-2084
Secretary Deborah P. Leeper rm 8D19 CP4..... 557-2084
General Information/Receptionist rm 8C17 CP4..... 557-3311
SAC JoAnn Davis rm 8C19 CP4..... 557-4784
251 Lasers, fiber optic devices and antennas William L. Sikes rm 8E04 CP4..... 557-2734
252 Electronic modulators, demodulators, oscillators, amplifiers, tuners and wave transmission lines and networks Eugene R. Laroche rm 7B18 CP4..... 557-4826
253 Semiconductor devices Andrew J. James rm 7B02 CP4..... 557-4835
254 Semiconductor and vacuum tube circuits and systems and electronic and electromechanical counting circuits and systems Stanley D. Miller rm 7B40 CP4..... 557-4752
255 Optical measuring and testing systems and photocell circuits Davis L. Willis rm 8D13 CP4..... 557-4345
256 Radiant energy systems Craig E. Church rm 8B40 CP4..... 557-4802
257 Optical systems and elements and vision testing and correcting John K. Corbin rm 8D33 CP4..... 557-3083

260 Communications, Measuring, Testing and Lamp/Discharge Group rm 5D17 CP4..... 557-3321
Director Stephen G. Kunin rm 5D19 CP4..... 557-1890
Secretary Iyone L. Miles rm 5D19 CP4..... 557-1890
General Information/Receptionist rm 5C24 CP4..... 557-3321
SAC Vivian C. Harris rm 5D21 CP4..... 557-2067
261 Telegraphy, telephony and audio systems Gene Z. Rubinson rm 5B02 CP4..... 557-6868
262 Television and television facsimile James J. Groody rm 5B16 CP4..... 557-6860
263 Multiplex communications, digital communications and telecommunications Robert L. Griffin rm 5E02 CP4..... 557-1139
264 Electrical communications and acoustic wave systems John W. Caldwell rm 5E16 CP4..... 557-3356
265 Measuring and testing of non-electrical phenomena Stewart Levy rm 6E02 CP4..... 557-6116
266 Lamp and discharge devices/systems and image analysis David K. Moore rm 5D01 CP4..... 557-6878
267 Measuring and testing of electrical phenomena Reinhard Eisenzopf rm 5D03 CP4..... 557-6879
268 Condition responsive communications, measuring and testing James L. Rowland rm 6E14 CP4..... 557-9894

MECHANICAL EXAMINING GROUPS
310 Handling and Transporting Media rm 5D17 CP3..... 557-3618
Director Bobby R. Gray rm 5D19 CP3..... 557-3677
Secretary Betty Rasmussen rm 5D19 CP3..... 557-3677
General Information/Receptionist rm 5C17 CP3..... 557-3618
SAC Margaret Stevens rm 5D17 CP3..... 557-3618
311 Dispensing, article dispensing, coin handling, check-controlled apparatus and elevators Joseph J. Rolla, Jr. rm 5A01 CP3..... 557-6765
312 Railways and railway equipment, motor vehicle wheels and bodies and article assorting Robert B. Reeves rm 4D17 CP3..... 557-3003
313 Handling implements, fluid conveying and spraying and fire extinguishers Joseph F. Peters, Jr. rm 5D01 CP3..... 557-3680
314 Brakes, fluid pressure brake systems, spring devices and sheet feeding or delivering devices (Vacant) rm 5B18 CP3..... 557-6746
315 Aeronautics and marine arts (Vacant) rm 6A01 CP3..... 557-1471
316 Land and motor vehicles John J. Love rm 5E02 CP3..... 557-6738
317 Article handling and conveyors and dumping vehicles Robert J. Spar rm 5D35 CP3..... 557-6732

320 Material Shaping, Article Manufacturing and Tools rm 6C17 CP3..... 557-3694
Director Samih N. Zaharna rm 6D19 CP3..... 557-3547
Secretary Anne A. Willey rm 6D19 CP3..... 557-3547
General Information/Receptionist rm 6C17 CP3..... 557-3694
SAC Vera Thomas rm 6C17 CP3..... 557-3694
321 Metal deforming, packaging machinery, butchering and woodworking
Robert Spruill rm 6E02 CP3..... 557-6039
322 Electrical connectors, gear cutting, milling and chucks Gil Weidenfield
rm 6D35 CP3..... 557-3698
323 Abrading, workholders, tools and paper manufactures Frederick Schmidt
rm 7D35 CP3..... 557-6506
324 Cutting, cutlery, tools, bookmaking, and printed matter Robert Kazenske
rm 6B18 CP3..... 557-6064
325 Metal founding, metal turning, miscellaneous hardware, fishing, vermin
trapping and welding Nicholas Godici rm 7D01 CP3..... 557-6513
326 Metal working, comminution and wire working Howard Goldberg rm 7D17 CP3..... 557-6520

330 Mechanical Technologies and Husbandry Personal Treatment Information
rm 4C17 CP4..... 557-3125
Director Richard E. Aegerter rm 4D19 CP4..... 557-3164
Secretary Theresa R. Godfrey rm 4D19 CP4..... 557-3164
General Information/Receptionist rm 4C17 CP4..... 557-3125
SAC Clara S. Desmukes rm 4D13 CP4..... 557-3125
331 Plants, plant culture, toys, earth working or jewelry Robert Hafer
rm 3A01 CP3..... 557-3131
332 Tobacco, toiletry, or exercising devices Richard Apley rm 4E16 CP4..... 557-3131
333 Dentistry, animal husbandry, harvesting and sign exhibiting or back
protection devices Louis Mancene rm 4D01 CP4..... 557-3131
334 Amusement games or educational devices Richard Pinkham rm 4B02 CP4..... 557-3131
335 Surgery diagnostic Kyle Howell rm 4E02 CP4..... 557-3131
336 Surgery instruments, medicators or receptors C. Fred Rosenbaum rm 4B22 CP4.. 557-3131
337 Printing, typewriting or excavating Edgar Burr rm 3D01 CP3..... 557-3131

340 Solar, Heat, Power and Fluid Engineering Devices rm 3C17 CP4..... 557-3128
Director Donley J. Stocking rm 3D19 CP4..... 557-3340
Secretary Carol A. Jones rm 3D19 CP4..... 557-3340
General Information/Receptionist rm 3C17 CP4..... 557-3128
SAC Verlene Day rm 3C17 CP4..... 557-3122
341 Expansible chamber motors and fluid power systems Robert Garrett rm 3B22 CP4 557-3464
342 Internal combustion engines including charge forming and ignition systems Charles Myhre rm 2D01 CP4..... 557-5690
343 Combustion power plants, reaction meters, pumps, rotary expansible chamber devices Carlton R. Croyle rm 3B02 CP4..... 557-0398
344 Environmental control, including heating, air conditioning, refrigeration and ventilation Albert Makay rm 3D01 CP4..... 557-0397
345 Combustion of fuels and substances, heating the environment and extracting heat from sun Samuel Scott rm 3E02 CP4..... 557-3467
346 Devices and methods for transferring heat from one material to another, turbochargers, superchargers, poppet valve operation and exhaust gas treatment for internal combustion engines, rotary internal combustion engines and powerplant of the type using natural heat William Cline rm 2B02 CP4..... 557-5679
347 Fluid handling which includes valves, pressure regulators and flow controllers for liquids and gases Martin Schwadron rm 3D41 CP4..... 557-6777

350 General Constructions, Petroleum and Mining Engineering rm 3C17 CP3..... 557-6200
Director Al Lawrence Smith rm 3D17 CP3..... 557-3414
Secretary Carol M. Sinclair rm 3D19 CP3..... 557-3414
General Information/Receptionist rm 3C17 CP3..... 557-6200
SAC Joyce G. Hill rm 3D13 CP3..... 557-6200
351 Joints and connections, pipe couplings, fences, earth & hydraulic engineering Cornelius J. Husar rm 4D01 CP3..... 557-6200
352 Gearing, power transmissions, clutches, machine elements Leslie A. Braun rm 3E16 CP3..... 557-6200
354 Building structures and components William F. Pate, III rm 3D21 CP3..... 557-6200
355 Supports, racks, fire escapes, ladders, scaffolds, flexible partitions Ramon S. Britts rm 4E02 CP3..... 557-6200
356 Petroleum, mining, highway and bridge engineering, well drilling, and endless belts James A. Leppink rm 4D35 CP3..... 557-6200
357 Tables, chairs, cabinets, windows, doors, buckles, buttons, clasps Kenneth J. Dorner rm 4A01 CP3..... 557-6200
358 Fasteners, safes, locks, closure fasteners, beds, control levers and linkages Gary L. Smith rm 3E02 CP3..... 557-6200

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Trademark Services Division, Director, Doreane Poteat rm 4C25 CP2..... 557-5249
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Secretary Beverly Hilliard rm 4D29 CP2..... 557-5249
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Application & Classification Section Leon Jackson rm 4B30 CP2..... 557-5255
Publication & Issue Supervisor Tony Milligan rm 4C23 CP2..... 557-5247
Post Registration Sec. Supervisor Portia Taylor rm 4C24 CP2..... 557-1986
Affidavit Examiners rm 4C24 CP2..... 557-1988
Renewal Examiners rm 4C24 CP2..... 557-1988
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Microfilm Section Lavette Favors & Della Williams rm 4D27 CP2..... 557-5255

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Deputy Sallye Rayford rm 1A03 CP2..... 557-2932
Outgoing - Incoming Mail Branch William Satterwhite rm 1A01 CP2..... 557-3233
Initial Review & Serializing Branch Sallye Rayford rm 1A03 CP2..... 557-3232
Correspondence Branch (Vacant) rm 1A03 CP2..... 557-3226
Facilities Management Division (Vacant) rm 802C PK1..... 557-7042
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Space and Telecommunications Branch William Morris rm 802C PK1..... 557-7331
Office Services Division Constant G. Fearing rm 803 PK1..... 557-0183
Travel Arrangements rm 803 PK1..... 557-7870
Support Services Branch Luther Campbell FERN..... 557-3560
Transportation Unit Jesse Holt FERN..... 557-1531
File Information Unit Jacqueline Waldo rm 1D01 CP3..... 557-9617
Official Search Unit Daisy Johnson FERN..... 557-9690

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Patent Search Room rm 1A03 CP3..... 557-2276
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Micrographics Branch (Crystal) Calvin Pullen..... 557-3079
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Classification and Routing Unit Norma White rm 7C20 CP2..... 557-3855
Administrative Examination Unit rm 7C10 CP2..... 557-3254
File Maintenance and Correspondence Unit Jeanette Gatling rm 7C12 CP2..... 557-1561
Special Handling Unit Arthur Stephens rm 7C18 CP2..... 557-3831
Data Input, Quality Control, and Assembly Unit Everette Oliver rm 7C24 CP2..... 557-3717
Re-Examination Pre-processing Unit L. Batchelor rm 7C10 CP2..... 557-1562
Assignment Branch Ann Harrell rm 7D13 CP2..... 557-3266
Examination Unit Virginia Clark rm 7C18 CP2..... 557-3247
Digest and Recording Unit Fred L. Bennett rm 7D13 CP2..... 557-3259
Title Unit Diane Russele rm 2C32 CP4..... 557-3826
Certification Branch Aberdeen Cutler 800 PK1..... 557-1552
Certification Section rm 800 PK1..... 557-1564
Input Records and Control Mary Grose 800 PK1..... 557-1587
Microfiche and Printing Mary Gartrell 800 PK1..... 557-1603
Court and Documentation Gladys Dorsey rm 800 PK1..... 557-1564

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Personnel Officer Carolyn P. Acree rm 700 PK1..... 557-2662
Assistant to the Personnel Officer Nancy C. Swanberg rm 700 PK1..... 557-2662
Secretary Mildred Jeter rm 700 PK1..... 557-2662
Classification and Employment Division Thomas H. Neuhauser rm 700 PK1. 557-1244
Employee and Labor Relations Division William H. Crout rm 700 PK1..... 557-3643
Personnel Psychologist Frank S. Abate rm 808C PK1..... 557-6327
Employee Development Division Mary Anna Culkin rm 601 PK1..... 557-3431
Personnel Processing Division Beverly Boykin rm 700 PK1..... 557-1208

Office of Labor Law Counsel Hugh D. Jascourt rm 700 PK1..... 557-9684

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Deputy Director Richard A. Bawcombe rm 6C07 CP2..... 557-9737
Publishing Division Ruth C. Mason rm 6C17 CP2..... 557-3283
Deputy Manager Sylvia F. Martin 6C17 CP2..... 557-6388
Allowed Files and Assembly Branch Yvette E. Simms rm 6C30 CP2..... 557-6395
Production Control Branch Willard D. Ireland rm 6C14 CP2..... 557-6412
Editorial Branch Marthina Thompson rm 6C06 CP2..... 557-6393
Data Base Query Section Nadine Newman rm 6C06 CP2..... 557-6392
Patent Copy Inspection Section Annie Kelly rm 6C06 CP2..... 557-6390
Drafting Branch Perry O. Burgess rm 6C30 CP2..... 557-6404
Statistical Analysis Division Michael Stellabotte rm 6C07 CP2 557-1963
Data Base Inspection Branch Melvinia Gary rm 6C10 CP2..... 557-6416
Certificates of Corrections Branch Mary H. Allen rm 809 PK1..... 557-0709
Technical Development Division Edwin P. Hall (Acting) rm 6C07 CP2..... 557-1992
Patent Maintenance Division C. H. Griffen rm 811 PK1..... 557-6945

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Marcia Campbell rm 600A PK1..... 557-1692
Supervisory Equal Opportunity Specialist Godfrey Beckett rm 600A PK1..... 557-1692
Equal Opportunity Specialist Sharon Carver rm 600A PK1..... 557-1692

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Secretary Karen Puller rm 600B PK1..... 557-5825
Project Managers:
Alvin Dorsey rm 600B PK1..... 557-5825
Jean E. Buckhout rm 600B PK1..... 557-5825
Greg P. Mullen rm 600B PK1..... 557-5825

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Secretary Cristina M. Moran rm 806 PK1..... 557-0014
Contract Division (Vacant) rm 806 PK1..... 557-0014
Small Purchases Division Mark Nucker (Acting) rm 806 PK1..... 557-0014

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Assistant Commissioner Bradford R. Huther rm 11D27 CP3..... 557-1572
Secretary Vickie T. Bryant rm 11D27 CP3..... 557-1572

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Execution and Control Division Harold E. Buswell rm 805 PK1..... 557-3817
Programs and Budget Division Aris G. Harrison rm 805 PK1..... 557-3417

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Director Leonard L. Nahme rm 802A PK1..... 557-3051
Secretary Virginia R. Clark rm 802A PK1..... 557-3051
Appropriation Accounting Division Thomas L. Gass rm 802B PK1..... 557-2983
Fee Accounting Division Frank S. Lane Sr. rm 1B01 CP2..... 557-3230
Deposit Account Branch Delores H. Riley rm 1B01 CP2..... 557-3227
Financial Management Division Robert M. Kopson rm 802A PK1..... 557-3051

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Administrator (Vacant) rm 1108 CP6..... 557-6000
Secretary Carla Bowman rm 1108 CP6..... 557-6000
Deputy Administrator (Vacant) rm 1108 CP6 557-6009
Secretary Anne M. Brown rm 1108 CP6 557-6009
Chief Program Management Support Services Joseph L. Shehade rm 1108 CP6..... 557-6003
Secretary Michele Helms rm 1108 CP6 557-6013

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Director Bruce Reynolds rm 1225 CP6..... 557-4114
Secretary Deneise Boyd rm 1225 CP6..... 557-4114

Office of Automation Concepts Implementation
Director Don W. LeCrone rm 1142 CP6..... 557-6156
Secretary Audrey Jackson rm 1142 CP6..... 557-6157

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Director L Liddle rm 1142 CP6..... 557-6154
Secretary (Vacant) rm 1142 CP6..... 557-6154

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Director Jeff J. Cochran rm 5D05 CP2..... 557-7862
Secretary Carol Lemieux rm 5D05 CP2..... 557-7862

Office of ADP
Director William J. Maykrantz rm 5D05 CP2..... 557-3646
Program Assistant Sylvia A. Huffman rm 5D05 CP2..... 557-3646
Systems Support and Operations Division John F. Fancovic rm 5D05 CP2... 557-3646
Data Systems Management Division Thomas E. Woomer rm 5D05 CP2..... 557-6330
Operations Division Donald Tynes rm 100 North CM1..... 557-1071
APS Operations Betty J. Wilson rm 100 North CM1..... 557-1071
Computer Operations Branch Charles W. Alston 100 North CM1..... 557-1071
Production Control Branch Leander McEwan rm 100 North CM1..... 557-1071
Data Systems Development Division Raymond R. Rahn rm 5D05 CP2..... 557-6332

CM1	Crystal Mall 1, 1911 Jefferson Davis Highway
CM2	Crystal Mall 2, 1921 Jefferson Davis Highway
CP1	Crystal Plaza 1, 2001 Jefferson Davis Highway
CP2	Crystal Plaza 2, 2011 Jefferson Davis Highway
CP3	Crystal Plaza 3, 2021 Jefferson Davis Highway
CP4	Crystal Plaza 4, 2201 Jefferson Davis Highway
CP6	Crystal Plaza 6, 2221 Jefferson Davis Highway
CP34	Crystal Plaza 34, 2021 Jefferson Davis Highway
CS4	Crystal Square 4, 1745 Jefferson Davis Highway
CS5	Crystal Square 5, 1755 Jefferson Davis Highway
CG2	Crystal Gateway 2, 1225 Jefferson Davis Highway
PK1	Crystal Park 1, 2011 Crystal Drive
PK2	Crystal Park 2, 2121 Crystal Drive
EADS	1232 South Eads Street
FERN	1411 South Fern Street
HCHB	Herbert C. Hoover Building, 14th & Constitution Avenue, N.W.
Warehouse	7401 Fullerton Road Springfied, Va. 22153

——REMINDER——

The use of Arlington street addresses slow down the receipt of mail being delivered by the U.S. Postal Service. Instead, mail should be addressed to the PTO using the Washington, D.C. 20231 address.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 25, 1986

Re. 32,153	4,574,861	4,589,357	4,602,468
D. 285,318	4,575,851	4,590,227	4,603,029
D. 285,406	4,576,520	4,590,294	4,603,169
4,137,976	4,576,826	4,590,392	4,603,377
4,371,651	4,576,869	4,590,810	4,603,689
4,405,156	4,576,913	4,590,817	4,603,896
4,455,651	4,577,202	4,591,074	4,605,295
4,467,160	4,577,766	4,591,227	4,606,062
4,493,536	4,578,668	4,591,739	4,606,146
4,502,325	4,578,714	4,592,161	4,606,292
4,511,810	4,578,842	4,592,361	4,606,461
4,517,269	4,579,204	4,592,427	4,606,494
4,537,892	4,579,393	4,593,107	4,607,412
4,539,750	4,579,819	4,593,134	4,607,439
4,541,462	4,579,839	4,593,411	4,607,473
4,544,488	4,580,641	4,594,104	4,607,497
4,544,741	4,581,341	4,594,176	4,608,268
4,544,906	4,581,618	4,594,403	4,608,648
4,551,404	4,581,879	4,595,924	4,608,684
4,554,065	4,583,201	4,596,001	4,608,963
4,554,369	4,583,418	4,596,350	4,609,323
4,559,051	4,583,468	4,596,406	4,609,428
4,561,824	4,584,469	4,597,043	4,609,431
4,562,761	4,585,560	4,597,448	4,609,466
4,563,686	4,585,681	4,598,642	4,609,499
4,564,017	4,586,643	4,598,723	4,609,506
4,564,076	4,586,980	4,599,215	4,609,651
4,564,411	4,587,177	4,599,704	4,609,792
4,565,028	4,587,423	4,599,855	4,610,258
4,565,704	4,587,475	4,600,010	4,610,817
4,565,856	4,587,627	4,600,350	4,610,880
4,566,171	4,588,613	4,600,473	4,611,484
4,568,548	4,588,642	4,600,985	4,611,617
4,569,562	4,588,718	4,601,653	4,611,687
4,571,872	4,589,005	4,602,028	4,612,619

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 30, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-07-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	6-01-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-21-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-25-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-04-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-03-86

Expiration of patents: The patents within the range of numbers indicated below expire during September 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,464,063 to 3,470,563, inclusive

Plant Patents ..... Numbers 2,918 to 2,926 inclusive

REEXAMINATIONS

NOVEMBER 25, 1986

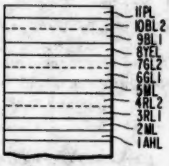
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,273,861 (593rd)

MULTILAYER COLOR PHOTOGRAPHIC MATERIALS UTILIZING AN INTERLAYER CORRECTION COUPLER

Keisuke Shiba; Takeshi Hirose; Jun Hayashi; Atsuaki Arai; Nobuo Furutachi, and Harumi Katsuyama, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Reexamination Request No. 90/000,795, Jun. 11, 1985.
Reexamination Certificate for Patent No. 4,273,861, issued Jun. 16, 1981, Ser. No. 660,581, Feb. 23, 1976.
Continuation of Ser. No. 480,802, Jun. 19, 1974, Pat. No. 3,961,960. This application Jun. 11, 1985, Ser. No. 660,581
Claims priority, application Japan, Jun. 19, 1973, 48-68892
Int. Cl.[4] G03C *7/00, 1/76*
U.S. Cl. 430—382



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2, 4, 5, 7,** and **8** is confirmed.

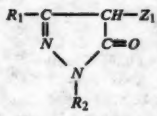
Claims **1, 3, 6** and **11** are cancelled.

Claim **9** is determined to be patentable as amended.

Claim **10**, dependent on an amended claim, is determined to be patentable.

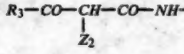
New claims **12–21** are added and determined to be patentable.

12. A multilayer color photographic material comprising a support having coated thereon at least two photosensitive silver halide emulsion layer units which provide dye images having substantially different colors from each other by color development, at least one of said photosensitive emulsion layer units containing a coupler (A) capable of undergoing a coupling reaction with the oxidation product of a primary aromatic amine color developing agent and an interlayer color correction coupler (B) capable of providing an interlayer interimage effect, which provides a dye having a different color than that of the dye formed by the coupling reaction of said coupler (A) and the oxidation product of the primary aromatic amine color developing agent, wherein in said photosensitive emulsion layer units the dye images provided by said coupler (A) and said coupler (B) are of the same type, said couplers (A) and said interlayer color correction couplers (B) being couplers represented by the following general formula (I)



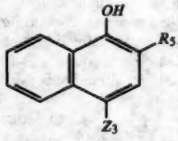
(I)

wherein R_1 represents an alkyl group, an aryl group, an alkoxy group, an aryloxy group, a heterocyclic ring, an amino group, a carbonamide group, or a ureido group; R_2 represents an alkyl group, an aryl group, or a heterocyclic group, and Z_1 represents in the case of coupler (A) a hydrogen atom or a group which is releasable on color development but which is not a development inhibitor and in the case of the interlayer color correction coupler (B), a group which is released as a or releases a development inhibitor at color development; the general formula (II)



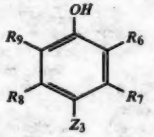
(II)

wherein R_3 represents an alkyl group or an aryl group; R_4 represents an aryl group; and Z_2 represents in the case of coupler (A) a hydrogen atom or a group which is releasable on color development but which is not a development inhibitor and in the case of the interlayer color correction coupler (B), a group which is released as a or releases a development inhibitor at color development; the general formula (III)



(III)

wherein R_5 represents a carbamyl group, a sulfamyl group, an alkoxycarbonyl group, or an aryloxycarbonyl group; and Z_3 represents in the case of coupler (A) a hydrogen atom or a group which is releasable on color development but which is not a development inhibitor and in the case of the interlayer color correction coupler (B), a group which is released as a or releases a development inhibitor at color development or the general formula (IV)



(IV)

wherein R_6 represents an alkyl group, an aryl group, a heterocyclic group, an amino group, a carbonamido group, a sulfonamido group, a sulfamyl group, or a carbamyl group; R_7, R_8, and R_9 each represents a halogen atom, an alkoxy group, an alkyl group, an aryl group, a heterocyclic group, an amino group, a carbonamido group, a sulfonamido group, a sulfamyl group, or a carbamyl group; and Z_3 represents in the case of coupler (A) a hydrogen atom or a group which is releasable on color development but which is not a development inhibitor and in the case of the interlayer color correction coupler (B), a group which is released as a or releases a development inhibitor at color development and with the

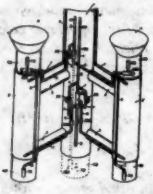
proviso that in any given photosensitive emulsion layer unit, coupler (A) and coupler (B) are not both selected from compounds represented by the same formula above and are not both selected from compounds represented by formulas (III) or (IV) above and with the further proviso that when a coupler (B) is present in a red light sensitive layer, it is not a compound of the formula (I).

B1 4,275,974 (594th)

INFLATION AND GROUT SYSTEM

Lloyd C. Knox, and Bob L. Sullaway, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Reexamination Request No. 90/000,942, Jan. 23, 1986.
Reexamination Certificate for Patent No. 4,275,974, issued Jun. 30, 1981, Ser. No. 12,674, Feb. 15, 1979.
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—225



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–71 is confirmed.

1. An inflation control valve system and a grouting control valve system for controlling the pressure and flow of inflation fluid during the inflation of upper inflatable packers and lower inflatable packers installed on a plurality of pile sleeves of an offshore platform and for controlling the pressure and flow of grouting material during the grouting of the annuli formed between a jacket leg and a pile driven therethrough and said plurality of pile sleeves and piles driven therethrough of said offshore platform, said inflation control valve system utilizing a single inflation line from the surface of said offshore platform to supply said inflation fluid to said upper inflatable packers and said lower inflatable packers installed on said plurality of pile sleeves and said grouting control valve system utilizing a single line from the surface of said offshore platform to supply said grouting material to said annuli,

wherein said inflation control valve system comprises:

upper packer inflation control valve means controlling the pressure at which said inflation fluid initially flows into said upper inflatable packers;

upper packer inflation check valve means connected to said upper packer inflation control valve means preventing said flow of inflation fluid from said upper inflatable packers after the inflation thereof;

lower packer inflation check valve means preventing said flow of inflation fluid from said lower inflatable packers after the inflation thereof; and

inflation valve means connected to said single inflation line to selectively control said flow of inflation fluid to said upper inflatable packer and said lower inflatable packer installed on a first pile sleeve of said plurality of pile sleeves and another upper inflatable packer and lower inflatable packer installed on a second pile sleeve of said plurality of pile sleeves; and

wherein said grouting control valve system comprises:

grouting valve means connected to said single grouting line to selectively control said flow of grouting material to said annuli.

B1 4,405,641 (595th)

CONSISTENCY REGULATOR FOR COSMETIC AND PHARMACEUTICAL PREPARATIONS

Karl Seibert, Duren, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Reexamination Request No. 90/000,899, Nov. 4, 1985.
Reexamination Certificate for Patent No. 4,405,641, issued Sep. 20, 1983, Ser. No. 280,037, Jul. 6, 1981.
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026071
Int. Cl.[4] A01N *37/08*; A61K *47/00*
U.S. Cl. 514—785

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2 and 3 are determined to be patentable as amended.

Claims 4–7, dependent on an amended claim, are determined to be patentable.

1. A cosmetic or pharmaceutical preparation comprising an effective amount of a pharmaceutically active material or a cosmetically useful material and an effective amount of a consistency regulator comprising a [monocarboxylic-2-hydroxy-alkylester] *12-hydroxystearic-2-hydroxy-alkylester* or mixture thereof made by reacting under esterification conditions [one or more monocarboxylic acids containing at least twelve carbons atoms] *12-hydroxystearic acid* with one or more 1,2-alkylene oxides containing from about 8 to about 40 carbon atoms.

B1 4,430,328 (596th)

RUMINANT LACTATION IMPROVEMENT

Curtis C. Scheiflinger, Morristown, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Reexamination Request No. 90/000,836, Aug. 16, 1985.
Reexamination Certificate for Patent No. 4,430,328, issued Feb. 7, 1984, Ser. No. 394,199, Jul. 1, 1982.
Continuation of Ser. No. 255,902, Apr. 20, 1981, abandoned.
Int. Cl.[4] A61K *37/10*
U.S. Cl. 514—8

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2–8, dependent on an amended claim, are determined to be patentable.

1. A method for improving *commercial* milk production in healthy lactating ruminants having a developed rumen function comprising orally administering a propionate increasing amount of a glycopeptide antibiotic *to a ruminant throughout the full term of lactation.*

B1 4,396,675 (597th)

STORABLE CROSSLINKABLE PRESSURE-SENSITIVE ADHESIVE TAPE

Gaylord L. Groff, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Reexamination Request No. 90/000,958, Feb. 14, 1986.
Reexamination Certificate for Patent No. 4,396,675, issued Aug. 2, 1983, Ser. No. 421,150, Sep. 22, 1982.
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—355

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–9 are now disclaimed.

[1. A tape comprising a backing and a pressure-sensitive adhesive layer comprising a copolymer of

(a) more than 90 parts of acrylic acid ester of nontertiary alcohol, the molecules of which have from 1–14 carbon atoms, the average being at most 12 carbon atoms, and

(b) at least one copolymerizable monoethylenic monomer selected from the group consisting of acrylic acid, methacrylic acid and itaconic acid, wherein the improvement comprises:

the adhesive layer includes in an amount within the range of about 0.1 to 10 percent by weight of the copolymer, a lower-alkoxylated amino formaldehyde condensate having C_{1-4} alkyl groups, said copolymer being substantially uncrosslinked until being heated.]

REISSUES

NOVEMBER 25, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,292

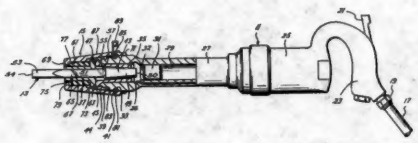
METHOD OF TEXTURING CONCRETE WITH DEEP TEXTURE HAMMER

Howard P. Gooden, 10611 Endicott, Houston, Tex. 77035

Original No. 4,149,513, dated Apr. 17, 1979, Ser. No. 712,104, Aug. 5, 1976. Application for reissue Apr. 13, 1981, Ser. No. 254,956

Int. Cl.[4] B28D *1/22*

U.S. Cl. 125—6 **10 Claims**



6. A method for texturing a concrete surface comprising the steps of:

A. securing a blunt-tipped rod to a pneumatically-powered jackhammer;

B. placing the blunt tip of the blunt-tipped rod against the concrete surface to be textured;

C. applying pressure to the jackhammer such that the blunt tip of the blunt-tipped rod is securely forced against the concrete surface;

D. activating the jackhammer; and

E. after activating the jackhammer moving the blunt-tipped rod in alternate strokes across the concrete surface while retaining said pressure; and

F. removing the blunt tip from contact with the surface before the blunt tip gouges the surface, whereby the concrete surface is substantially roughened.

Re. 32,293

OVERHEAD ELECTRIC TRANSMISSION SYSTEMS

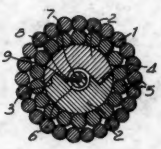
Phillip Dey, New Barnet; Peter Fearns, Huyton; Karl W. Plessner, Kings Langley; Kenneth H. Pickup, Uppermill nr. Oldham; Bernard Gaylard, Altrincham, and Arthur B. Murphy, Rainford, all of England, assignors to BICC Limited, London, England

Original No. 4,359,598, dated Nov. 16, 1982, Ser. No. 220,291, Dec. 29, 1980. Continuation of Ser. No. 904,557, May 10, 1978, abandoned. Application for reissue Nov. 13, 1984, Ser. No. 671,100

Claims priority, application United Kingdom, May 13, 1977, 20234/77; Jan. 24, 1978, 2861/78

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **13 Claims**



1. An overhead flexible electric transmission conductor adapted to be freely supported from spaced supports in long lengths, comprising a substantially circumferentially rigid central core comprising at least two bare elongate members of metal or metal alloy assembled together to form an elongate body having a central bore extending throughout the length of the core and constituting an elongate compartment, each bare elongate member of the central core being of such a transverse cross-sectional shape that they inter-engage at least to limit the extent of lateral movement between the elongate members; at least one separate flexible optical guide loosely housed in the elongate compartment; and, surrounding the central core, at least one stranded layer of helically wound bare elongate elements of metal or metal alloy.

Re. 32,294

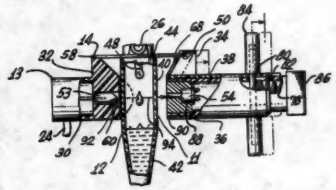
DROP SENSING UNIT AND ASSOCIATED DRIP CHAMBER FOR IV FLUID ADMINISTRATION

Wallace L. Knute, Del Mar, Calif., assignor to Ivac Corporation, San Diego, Calif.

Original No. 4,397,648, dated Aug. 9, 1983, Ser. No. 204,771, Nov. 7, 1980. Application for reissue Aug. 2, 1985, Ser. No. 762,051

Int. Cl.[4] A61M *5/16*

U.S. Cl. 604—253 **22 Claims**



15. Apparatus for producing and monitoring drop flow, comprising:

a drop sensing unit;

an associated drip chamber having a vertical path of drop flow therethrough and having mounting means thereon;

first means on said drop sensing unit for removably engaging said mounting means of said drip chamber and including alignment means for automatically positioning drop sensor unit relative to said drip chamber, said first engaging means and said mounting means cooperating to restrict said drop sensing unit to use with said associated drip chamber to provide accurate drop flow monitoring; and

second means on said drop sensing unit for engaging said drip chamber at least at a location vertically spaced from said mounting means along said path, said second means cooperating with said engaging first means to exert clamping forces on said drip chamber substantially normal to said drop flow path at no more than three regions of engagement.

Re. 32,295

HINDERED PHENYL ESTERS OF CYCLIC BORATES AND LUBRICANTS CONTAINING SAME

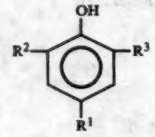
Milton Braid, Haddonfield, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Original No. 4,474,670, dated Oct. 2, 1984, Ser. No. 481,704, Apr. 4, 1983. Application for reissue Dec. 7, 1984, Ser. No. 679,517

Int. Cl.[4] C10M *137/10, 139/00, 141/12*

U.S. Cl. 252—32.7 E 25 Claims

1. A reaction product prepared by reacting (1) a hindered phenol of the formula



wherein R^1 is a C_1 to C_{30} hydrocarbyl group and R^2 and R^3 are the same or different alkyl groups containing 4 to 18 carbon atoms, (2) a boron compound of the formula

$$[(RO)_p(BO_2)_qYnZr] \quad (RO)_p(BO_2)_qY_nZ_r$$

wherein R, Y and Z are selected from the group consisting of hydrogen and a C_1 to C_6 alkyl group, p, n and r are 0 to 2 and q is 1 to 3 and (3) an amine of the formula

$$R^4N(R^5OH)_2$$

wherein R^4 is a hydrocarbyl group containing 4 to 30 carbon atoms and R^5 is an alkylene or substituted alkylene group containing 1 to 12 carbon atoms, the reaction being carried out at from about 75° C. to about 250° C. and with proportions of reactants to give a [phenol:boron compound] *boron compound:phenol* ratio of from about [0.1:1 to about 1:15] *0.1 to 1* and from about 1 to about 2 mole equivalents of amine based on each mole of the phenol:boron compound moiety formed.

Re. 32,296

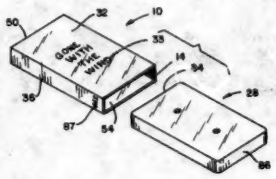
PACKAGING SYSTEM FOR VIDEO CASSETTES

Robert M. Wynalda, Rockford, Mich., assignor to Wynalda Litho Inc., Rockford, Mich.

Original No. 4,488,644, dated Dec. 18, 1984, Ser. No. 582,021, Feb. 21, 1984. Application for reissue Jun. 26, 1985, Ser. No. 737,505

Int. Cl.[4] B65D *85/672, 85/00, 5/44, 6/06*

U.S. Cl. 206—387 37 Claims



20. A cassette packaging system comprising:

a printed sleeve dimensioned to closely receive a first relatively large cartridge, said sleeve including a pair of opposite ends and a pair of opposite sides, whereby the first cartridge is packaged for retail sale simply by sliding the first cartridge into said printed sleeve through one of said ends; and

a tray dimensioned to fit within said sleeve, said tray including a floor and sidewall means extending upwardly therefrom for spacing a second relatively small cartridge from at least one of said sleeve sides, said tray further including spacer means for spacing the second cartridge from at least one of said sleeve ends, whereby the second cartridge is packaged for retail sale by sliding the second cartridge onto said tray and into said printed sleeve through said one sleeve end with the cartridge abutting said sidewall means and said spacer means.

PLANT PATENTS

GRANTED NOVEMBER 25, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,808

CARNATION NAMED LONCARTO

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, Les Maures, France

Filed Nov. 8, 1984, Ser. No. 669,480
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt—70 **1 Claim**

1. A new and distinct spray carnation cultivar, substantially as herein shown and described, characterized by the white petals of its small flowers which have serrated margins of cardinal red color, the flowers being profusely produced during each of the recurrent blooming seasons and the plant having a vigorous growth habit and being resistant to *Fusarium oxysporum.*

5,809

CHRYSANTHEMUM PLANT NAMED COMET

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 1, 1984, Ser. No. 636,505
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Comet as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of tubular capitulum form; spider capitulum type; purple ray floret color; diameter across face of capitulum ranging from 7 to 9 cm. at maturity; uniform nine week flowering response; medium plant height when grown single stem; 15 to 25 cm. peduncles on open, normally terminal sprays, and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

5,810

CHRYSANTHEMUM PLANT NAMED ELFIN

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 1, 1984, Ser. No. 636,504
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Elfin, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of small pompon capitulum form; formal decorative capitulum type; light red-purple ray floret color; diameter across face of capitulum ranging from 4.5 to 5.5 cm. at maturity; uniform nine week flowering response; medium plant height when grown single stem; 15 to 20 cm. peduncles on open, normally terminal sprays; and 13° C. minimum temperature tolerance for initiation and development of flowering buds with rapid flowering down the stem.

5,811

CHRYSANTHEMUM PLANT NAMED EN GARDE

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 27, 1984, Ser. No. 644,270
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named En Garde, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; red-purple ray floret color; diameter across face of capitulum ranging from 9 to 10 cm. at maturity; uniform eight week flowering response; medium plant height; semi-spreading branching pattern; and tolerance of both low winter 13° C. minimum and high summer 24° C. night to 38° C. temperatures for bud initiation and flower development.

5,812

TOMATO PLANT 'PEZZULLA'

Anna M. Pezzulla, P.O. Box 207, Morrisdale, Pa. 16858

Filed Jul. 5, 1984, Ser. No. 627,900
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of paste-type tomato plant, as described and illustrated, characterized by a thick stalk and closely-spaced stems, and slender, light green, relatively sparse leaves, long, thin clustered blossoms developing into very numerous, very uniform and very large stocky, elongated plum-shaped fruit varying somewhat to tapering or teardropped shape with a short conical nipple, the fruits being very meaty and with few seeds, the overall plant being quite hearty and drought resistant.

PATENTS

GRANTED NOV. 25, 1986

ERRATA

For CLASS	See PATENT NO.
036-050	4,624,051
057-232	4,624,097
128-652	4,624,235
379-412	4,624,514
524-080	4,624,761
530-366	4,624,804
530-376	4,624,805
514-077	4,624,852
379-028	4,625,077
379-145	4,625,078
379-077	4,625,079
379-104	4,625,080
379-088	4,625,081
379-273	4,625,082
379-389	4,625,083

PATENTS

GRANTED NOVEMBER 25, 1986

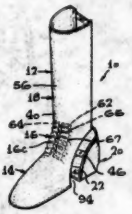
GENERAL AND MECHANICAL

4,624,015

KARATE AND KICK BOXING PROTECTIVE BOOT

James D. Bottoms, 15540 Vicennes, Sepulveda, Calif. 91343

Filed Aug. 27, 1984, Ser. No. 644,458
Int. Cl.[4] A41D *13/06*; A43B *5/00*
U.S. Cl. 2—22 **6 Claims**



1. A protective fighting boot which can be worn by a person in practicing karate and kick boxing, comprising:

a leg protector which has a lower portion that covers the top of the foot and an upper portion that covers the shin, said leg protector having means for holding itself to the leg of the wearer including a portion that almost completely surrounds the leg at a location above the ankle; and

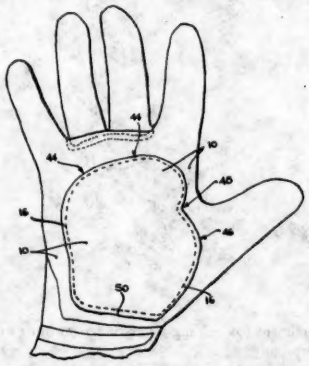
a substantially separate heel protector which has a rearward portion of largely fixed concave shape that surrounds the heel region of the wearer, said rearward portion having a pair of sides that lie on opposite sides of the wearer's heel, and being attached to said leg protector by a pair of straps tht extend between said opposite sides and locations substantially on the lower portion of said leg protector, the length of each of said straps between said heel protector and said leg protector locations being adjustable to enable attachment of the same heel protector to feet of different lengths.

4,624,016

ATHLETIC GLOVE WITH BUILT-IN CUSHIONING

Freddie D. Luevano, 2542 N. Delta St., Rosemead, Calif. 91770

Filed Sep. 26, 1984, Ser. No. 654,656
Int. Cl.[4] A41D *13/10*; A63B *71/14*
U.S. Cl. 2—161 A **4 Claims**



1. A glove for wearing by participants in athletic events to protect the underside of the hand in both the gripping position and in the open position without interfering with the flexing of the thumb and fingers, including:

first leather-like sheet means constituting an external cover member shaped for snugly overlying the entire underside of the hand from the wrist crease line below the heel of the hand up to the basal thumb crease line and the basal finger crease lines;

cushion layer means located inside of said first sheet means and having a cross-sectional area and corresponding diameters which are both less than said first sheet means, said cushion layer means having a normal thickness of between approximately $\frac{1}{4}$ inch and $\frac{1}{2}$ inch throughout its entires area for insulating against direct and indirect impact stresses received through said external cover member;

second leather-like sheet means constituting an internal cover member having a cross-sectional area and perimeter shape approximately identical to said cushion layer means; and

wherein said cushion layer means and said internal cover member constitute a composite member sized and shaped to completely cover the central portion of the palm of the hand and to partially cover the ball of the thumb and the interdigital pads opposite the basal finger knuckles in order to leave the basal thumb crease line and the basal finger crease lines displaced from said cushion layer means when the hand is in the open position, said composite member being sized and shaped to have a convex top edge when viewed from the vantage point of the fingers, a convex side edge adjacent the basal thumb crease line when viewed from the vantage point of the thumb, and to have a marginal indentation on its side edge immediately adjacent to the anatomical snuffbox portion of the hand, thereby allowing said external cover member to fold with only minimal bunching along the base of the thumb and fingers when the hand is in the gripping position; and

attachment means located along the peripheral border of said composite member for connecting said internal cover member to said external cover member with said cushion layer means sandwiched therebetween, and wherein said attachment means passes through and interconnects each of said external cover member, said cushion layer means, and said internal cover member.

4,624,017

AUTOMATIC FLUSHING SYSTEM

John D. Foletta, 38 Maple St., Holloway Beach, Queensland, 4871, Australia

Filed Jun. 11, 1985, Ser. No. 743,689
Int. Cl.[4] E03D *13/00*
U.S. Cl. 4—304 **11 Claims**

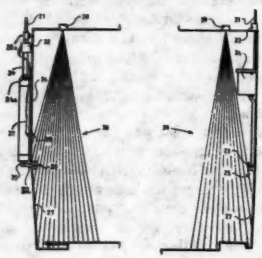
1. An automatic flushing system for controlling the flushing operation of a urinal, the system comprising:

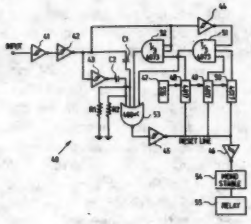
a remotely controllable valve arranged in a flow path of an inlet to the urinal;

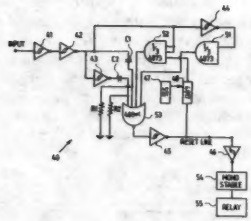
sensor means for detecting the presence of a person intending to use said urinal;

first valve controlling means operatively coupled to said valve and to said sensor means for operating said valve in response to signals from said sensor means, said controlling means including timer means for providing an output for a first predetermined time period in response to a detection signal from said sensor means indicating the arrival of a user at said urinal, said timer means being operatively connected to said valve for opening same to flush said urinal during said first predetermined time period, said controlling means further including counter means operatively connected to said sensor means for counting out a second predetermined time period in response to said detection signal, said counter means being

operatively connected to said timer means for inhibiting further operation thereof in response to continued movement by the user at said urinal and for enabling an actuation of said timer means upon departure of the user to provide a further output to said valve for opening same to flush said urinal for another period equal in duration to said first predetermined time period.







4,624,018

TOILET FLUSHING APPARATUS

John G. Kurtz, 45 Oak Bend La., Rochester, N.Y. 14617

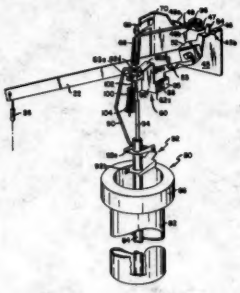
Continuation-in-part of Ser. No. 665,706, Oct. 29, 1984, abandoned. This application Mar. 28, 1985, Ser. No. 717,125

Int. Cl.[4] E03D 1/14

U.S. Cl. 4—325 **24 Claims**

1. Toilet flushing apparatus for selectively dispenaing either of two different volumes of water through an outlet formed in the base of a water closet, said water closet including a movably mounted valving member for selectively closing and opening such outlet to respectivelv prevent and allow the passage of water therethrough, said apparatus comprising:

(a) manually operable means for applying a displacement force to said valving member to selectively move said member from a rest position, in which it closes said outlet, to either (i) a first position which is so far displaced from the outlet that said valving member will not return to its rest position, notwithstanding removal of such displacement force, until substantially all the water in the water closet passes through the outlet, or (ii) a second position directly above and closely spaced from the outlet in which said valving member will immediately return to its rest position in respnse to removal to such displacement force, said manually operable means comprising a movably mounted lever arm operatively coupled to said valving member, and handle means for selectively moving said lever arm upwardly from a rest position through first or second different displacement ranges to cause said valving member to move from its rest position to either said its first or second position, respectively; and



(b) latching means for selectively latching said valving member in said second position until a predetermined volume of water has passed throuch the outlet, and for unlatching said member thereafter to allow said member to return to its rest position.

4,624,019

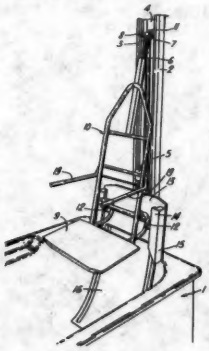
APPARATUS FOR HELPING A PERSON TO GET IN OR OUT OF A BATH

Cyril M. Pennington-Richards, 1 Tithe Barn Close, Aldwick Bay, Bognor Regis, West Sussex, United Kingdom

Continuation-in-part of Ser. No. 612,261, May 21, 1984, abandoned. This application Nov. 23, 1984, Ser. No. 674,412

Int. Cl.[4] A47K 3/12

U.S. Cl. 4—566 **20 Claims**



1. Apparatus for helping a person to get in or out of a bathtub, comprising:

a hydraulic jack mounted firmly in an upright position adjacent the bathtub and having a vertically movable member arranged to be vertically extended and retracted by a supply of fluid under pressure;

valve means to control the supply of fluid under pressure;

control means to actuate the valve means;
fixed guide and support means mounted firmly in an upright position adjacent the hydraulic jack for guiding and laterally supporting the vertically movable member of the jack during extension and retraction;
a substantially vertical carrier which is pivotally suspended by its upper end from the vertically movable member of the jack having a seat mounted at the lower end of the carrier, said lower end of the carrier further provided with a pair of wheels through which the carrier contacts and rides easily over the inside of the bathtub as the seat is raised and lowered, in the bathtub with raising and lowering of the moveable member of the jack;
a removable flexible sheet which covers and protects the inside surface of the bathtub followed b, the lower end of the carrier when the seat is raised and lowered, the sheet being provided with tracks for guiding the wheels on the lower end of the carrier; and
means to pivot the seat about the horizontal axis to allow the lower end of the carrier to contact and follow the contour of the inside of the bathtub as the seat is raised and lowered.

4,624,020

SINK UNIT PARTICULARLY HOUSEHOLD KITCHEN SINK UNIT

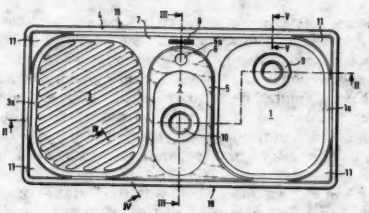
Herbert Abderhalden, Rothrist, Switzerland; Duncan B. Marr, Wilmslow, Great Britain; Ivan Heimann, Egerkingen, and Jürg Schmid, Kilchberg, both of Switzerland, assignors to Niro-Plan AG, Zug, Switzerland

Filed Jul. 15, 1985, Ser. No. 754,589

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 3432695

Int. Cl.[4] E03C *1/24*

U.S. Cl. 4—651 **16 Claims**



1. A multi-basin sink unit with a hygenically and visually isolated common overflow drain, particularly a kitchen sink for household use, having
a forward edge region (18) and a rear edge region (19);
a first, main wash sink unit or region (1) having an upper rim (1a) and a drain (9) therein;
a second wash sink unit or region (2) having a drain (10) therein,
the second wash sink region being substantially narrower than the main wash sink region (1);
a third, water receiving region (3) adjacent one of said sink regions (1, 2);
a circumferential water retention rim (4) surrounding the extreme outline of said sink units or regions, and
comprising, in accordance with the invention,
a raised zone (5) surrounding the upper rim of the second, narrower wash sink unit or region (2),
said raised zone (5) merging with the circumferential water retention rim (4) at its forward edge zone (18), said raised zone (5) being spaced from the water retention rim (4) at its rear edge zone (19) and leaving
a gap region (7) between the raised zone (5) and the water retention rim (4) at the rear edge zone;
a common overflow drain opening (8) located in said gap region (7) and
wherein the maximum elevation of said gap region (7) surrounding said common overflow drain (8) is less than the elevation of a peripheral edge of said third water receiving region or zone (3), less than the elevation of said upper rim (1a) of said main sink (1) and less than the elevation of sid raised zone (5) surrounding said second, narrower sink (2), thereby permitting overflow into said common drain (8) from any of said first sink (1), second sink (2), and third water receiving zone (3), while simultaneously preventing cross-contamination therebetween, due to overflow water.

4,624,021

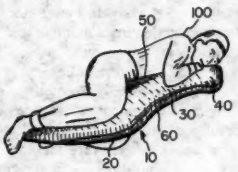
CUSHION-LIKE SUPPORT

Jean A. Hofstetter, 4572 Doverdell Dr., Pittsburgh, Pa. 15236

Filed Feb. 11, 1985, Ser. No. 700,099

Int. Cl.[4] A47G *9/00*

U.S. Cl. 5—431 **2 Claims**



1. A cushion-like support at least thirty four inches in length, adapted to be used by a user reclined on the side said support comprising a wider body portion, at least thirteen inches wide at its widest, adapted to be positioned between the two ankles two legs and two knees of the user in the knees drawn up position, a narrower neck portion integral with said body portion and adapted to the positioned adjacent the torso of the user, and extending to at least the shoulder area of the user, said neck and body portions being of approximately equal thickness and having a continuous, substantially linear proximal surface, said body portion having an arcute distal surface, said proximate and distal surfaces being substantially normal to the horizontal in the use position of the support.

4,624,022

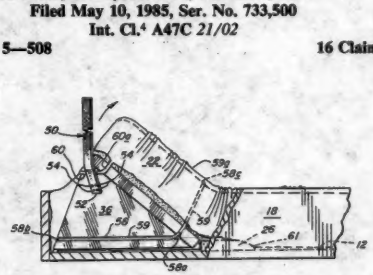
DEVICE FOR HOLDING A SHEET OR COVER IN POSITION ON THE SURFACE OF A WATER BED MATTRESS

Donald G. Dolan, 893 Ayrshire Ct., Frankfort, Ill. 60423

Filed May 10, 1985, Ser. No. 733,500

Int. Cl.[4] A47C *21/02*

U.S. Cl. 5—508 **16 Claims**



1. For use with a water bed construction having an upright water mattress side enclosing frame, with at least one corner frame arrangement, and a water mattress support adjacent the lower end of the upright side frame;
the improvement of a bed make-up appliance for retaining at

least one cover member, that is provided with an embracing cord means, for securing the cover member to the top of the water bed mattress in a corner-shaped and tension held arrangement relative to the bed frame's corner frame arrangement and the support for the water bed's mattress; said improvement comprising, in combination:

a corner-located holder for use in a corner of the upright side frame for the water bed's mattress and supported on the mattress' support, said holder including a diagonal brace member positioned on said mattress' support and below the water bed mattress and being of a length to abut two transverse sides of the bed frame's corner defining portion of the bed's side enclosing frame, to define a substantially polygonal space between the brace member and the adjacent corner of said upright side frame;

a polygonal lifting member located below the corner of the water bed's mattress and being hinged to the diagonal edge of the brace member that lies closest to the corner of the side frame;

the shape of said polygonal lifting member being generally congruent with, but of smaller edge size, than the polygonal space between the brace member and the corner of the upright side frame;

an elongated strap-like pull member secured to a portion of the lifting member distally from the brace member, to provide means for selectively raising and pivoting the lifting member about the axis of the hinge connection of the lifting member to the brace member;

and at least one cord holding means provided on the lifting member and adapted to receive therein a portion of a fastening cord provided on a cover member for the water bed mattress.

4,624,023

PROCESS AND APPARATUS FOR WASHING TEXTILE MATERIAL

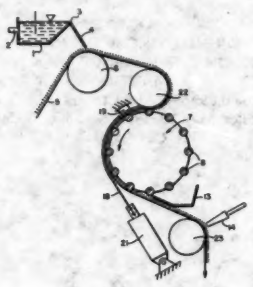
Gerold Fleissner, Chur, Switzerland, assignor to Fleissner GmbH & Company, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,504

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335542

Int. Cl.[4] D06B *1/14, 23/00*

U.S. Cl. 8—151 **4 Claims**



1. A process for washing textile material, especially pile-type carpets, by working foam into the textile material and by removing the foam thereafter, characterized in that a pile side of a continuously fed textile material is continuously wetted at an elevated temperature with a non-foamed washing liquor containing a foam-producing chemical, the foam is produced thereafter on the pile side of the textile material by alternating compression and pressure relief of the surface of the textile material by contacting the surface with a stroking means, thus loosening the dirt, and, for dirt removal, the foam is subsequently continuously removed by suction from the pile side of the textile material.

4,624,024

METHOD FOR THE MANUFACTURE OF A SELF-LOCKING NUT

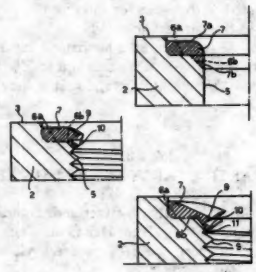
Andrea Bazzurro, Monza, Italy, assignor to Bulloneria Barge S.p.A., Italy

Filed Oct. 29, 1984, Ser. No. 665,851

Claims priority, application Italy, Oct. 28, 1983, 68130 A/83

Int. Cl.[4] B21D *53/24;* **B21K** *1/70*

U.S. Cl. 10—86 A **2 Claims**



1. A method for manufacture of a self-locking nut comprising:

performing a first pressing operation to form a nut body with first and second end surfaces, a hole having a smooth surface extending axially of said nut body and a central recessed portion in said first surface surrounding said hole and having a plurality of equally spaced, axially extending projections located within said recessed portion with a surface of each projection facing the central axis of the nut body defining a contiguous extension of the surface of said hole;

forming a thread within said hole with the first turn of said thread being formed in said surface of each projection facing the central axis of the nut body; and

performing a second pressing operation subsequent to said thread forming for squashing at least said first turn of the thread of said hole immediately adjacent said first end surface axially toward said second end surface.

4,624,025

PROTECTIVE DEVICE FOR FLOOR CLEANING APPARATUS

Heinz Kaulig, and Klaus Stein, both of Velbert, Fed. Rep. of Germany, assignors to Stein & Co. GmbH, Velbert, Fed. Rep. of Germany

Filed May 9, 1984, Ser. No. 608,621

Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318604

Int. Cl.[4] A47L *11/32*

U.S. Cl. 15—41 R **2 Claims**

1. Floor cleaning apparatus comprising:

(a) a housing including means defining a lower substantially planar surface arranged to face the floor;

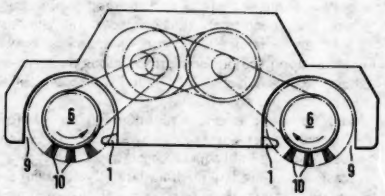
(b) at least one elongated recess in said means defining said lower surface of said housing;

(c) an elongated brush roller rotatably mounted in said at least one recess in said means defining said lower surface

of said housing and having bristles projecting radially about its periphery and continuously along substantially its entire axial length, said brush roller being positioned in said at least one recess such that the bristles on the underside of said brush roller project below said lower substantially planar surface to contact the floor;

(d) drive means connected to said brush roller for rotating said brush roller in only one predetermined rotary direction such that said bristles pass through a cylindrical path about said brush roller and enter the interior of said at least one recess along one side of said at least one recess; and

(e) a plurality of spaced carpet deflectors projecting, substantially horizontally along said one side of said at least



one recess, from said means defining said lower substantially planar surface into said annular path of said bristles towards said brush roller, the free ends of said plurality of spaced deflectors being spaced from the periphery of said brush roller, to prevent corners or edges of a carpet from being pushed into said at least one recess by said rotating brush roller;

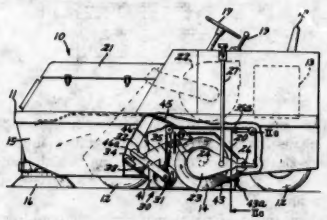
(f) whereby no unbrushed streaks can be produced on the floor since the bristles in contact with the floor do not have spaced gaps therebetween caused by said deflectors at said spaced locations along said one side of said at least one recess and said brush roller may be removed from said at least one recess without first removing said plurality of deflectors.

4,624,026

SURFACE MAINTENANCE MACHINE WITH ROTARY LIP

Donald L. Olson, and Donald L. Thomsen, both of Minneapolis, Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Sep. 10, 1982, Ser. No. 416,659
Int. Cl.[4] E01F *1/04, 1/08*
U.S. Cl. 15—340 **16 Claims**



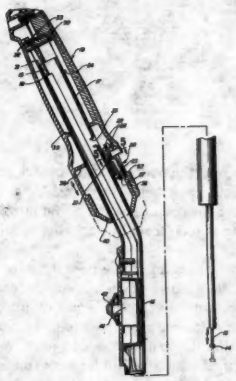
1. A sweeper comprising a body including a debris hopper, a power source, means for moving the sweeper along a surface, a driven cylindrically shaped brush for sweeping debris into said hopper, a rotary lip associated with said brush, means for rotatably driving said brush to assist in moving said debris into said hopper, said rotary lip being supported by arm means in a position spaced above the surface to be swept, said rotary lip support arm means being adapted to permit vertical movement of said rotary lip, thereby permitting movement of large debris pieces beneath said rotary lip, said support arm means comprising a pair of arm structures, one arm structure being disposed at either end of said rotary lip, said arm structures each being mounted with respect to the sweeper body by a ball and socket structure.

4,624,027

MOVABLE HANDLE STRUCTURE FOR CONTROL OF SELF-PROPELLED VACUUM CLEANER

Dean C. Martin, Golden Valley, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 22, 1984, Ser. No. 663,737
Int. Cl.[4] A47L *9/00*
U.S. Cl. 15—340 **21 Claims**



1. In a vacuum cleaner having a dirt pickup suction nozzle provided with carriage wheels, drive means for selectively forwardly and rearwardly driving said wheels, and a handle extending upwardly from the nozzle for use in manually guiding the nozzle in a suction cleaning operation, improved means for manipulating the vacuum cleaner comprising:

means on said handle defining an elongate distal end;

a sleeve longitudinally movably carried on said handle distal end;

connecting means extending along said handle from said sleeve to said nozzle for controlling said drive means as a function of the disposition of said sleeve on said handle distal end;

cooperating locking means on said sleeve and handle distal end for selectively locking the sleeve in a preselected neutral disposition wherein said connecting means causes said drive means to be in a neutral disposition wherein the wheels are undriven;

first cooperating stop means on said sleeve and handle distal end for defining a first displaced disposition of the sleeve and connecting means disposed in a first longitudinal direction from said neutral disposition of the sleeve for causing operation of the drive means in a forward direction as a function of the displacement of said sleeve from said neutral disposition to said first displaced disposition; and

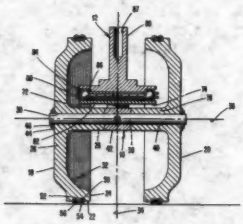
second cooperating stop means on said sleeve and handle distal end for defining a second displaced disposition of the sleeve and connecting means disposed in an opposite second, longitudinal direction from said neutral disposition of the sleeve for causing operation of the drive means in a rearward direction as a function of the displacement of said sleeve from said neutral disposition to said second displaced disposition, said manipulating means further defining speed control means for selectively varying the speed of the drive means.

4,624,028

OMNIDIRECTIONAL ROLLING SUPPORT HAVING CASTERING INDUCED BY ROTATIONAL RESISTANCE

Donald F. Wilkes, Albuquerque, N. Mex., assignor to Vern Heinrichs, Toronto, Canada, In Trust

Filed Jan. 22, 1985, Ser. No. 692,637
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—18 B 9 Claims



1. A rolling support assembly for an object comprising:

a pair of wheels, each being mounted by a corresponding wheel bearing for rotation about a first horizontal axis, the wheels being spaced from one another along the horizontal axis;

stem means for connecting the wheels to an object, the stem means including a first portion for connection to the object, a second portion for connection with the horizontal axis, and a thrust bearing connecting the first and second portions so that the first and second portions are rotatable about a vertical axis which intersects the horizontal axis between the wheels, said second portion including symmetrically extending portions;

a separate member having a longitudinal axis aligned with the horizontal axis and being pivotally connected between said extending portions for rotation about a second horizontal axis which is perpendicular to the first horizontal axis and which intersects the first horizontal axis; and

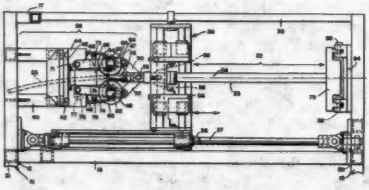
each of the wheel bearings having a first resistance to rotation, the thrust bearing having a second resistance to rotation, the second resistance being less than the first resistance, and the difference between the first and second resistances to rotation being operable to cause castering of the wheels to align them with the direction of movement.

4,624,029

SHIRRING DEVICE

Roman M. Tomczak, Raleigh, N.C.; William W. Babcock, Riverdale, and Lee E. Petsche, Burr Ridge, both of Ill., assignors to Tipper Tie, Inc., Apex, N.C.

Filed Oct. 15, 1985, Ser. No. 787,506
Int. Cl.[4] A22C *13/02*
U.S. Cl. 17—1 R 7 Claims



1. Apparatus for shirring of casing comprising, in combination:

a mounting platform;

a stationary, shirring wheel, support station on the platform, said station including:

a support bracket attached to the platform,

first and second generally parallel, spaced, opposed, support arms, each arm pivotally attached at one end to the bracket, the opposite end of one arm pivotal toward and away from the opposite end of the other arm,

means for pivoting at least one of the arms toward and away from the other arm,

said arms extending generally parallel to the direction of movement of casing to be shirred, each of said arms including a shirring wheel rotatably mounted thereon, said wheels being opposed to one another,

drive means for driving said wheels to shirr casing fed between said wheels as said means for pivoting maintains the wheels in physical contact with casing material fed therebetween;

a mandrel supported on the platform along an axis generally tangent to the wheels and aligned for receipt of shirred casing from the wheels; and

a casing transport assembly mounted on the platform for reciprocal movement axially toward and away from the wheels, said assembly including:

at least one casing jaw member laterally adjacent the axis,

means for moving the jaw transversely toward the axis to engage shirred casing,

means to translate the jaw axially to compact the shirred casing on the mandrel as the assembly is translated axially away from the wheels,

means for releasing the jaw from engagement with shirred casing by movement in a direction transverse to the axis, and

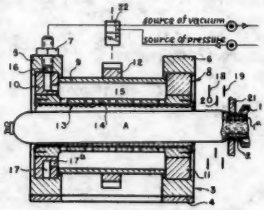
means to translate the jaw axially for returning the jaw to its original position along the axis.

4,624,030

STUFFING MACHINE FOR FOOD PRODUCTS

Ilya Dreisin, 353 W. 57th St. #1257, New York, N.Y. 10019

Filed Apr. 1, 1985, Ser. No. 718,991
Int. Cl.[4] A22C *11/10*
U.S. Cl. 17—33 9 Claims



1. A stuffing machine for food products, comprising

holding means for holding and continuously supplying an upstream portion of a tubular casing which includes a stuffing tube for stuffing the tubular casing with stuffing material and

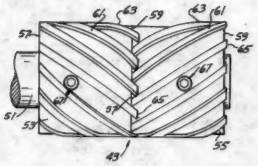
supporting means located downstream of said holding means and arranged for supporting a stuffed downstream portion of the tubular casing and turning that portion so as to twist the tubular casing in the region between said two means, wherein said supporting means includes a stator and a multitubular rotor, turnable relative to said holding means, said rotor has a swelling member with an inner space, which is formed by an external part with air communicating means, an annular stretching part for radially surrounding downstream filled portion of the tubular casing and a perforate part located between said external part with communicating means and said stretching part.

4,624,031

DESCALER ROLL FOR FISH SCALING MACHINE

Albert Simard, Windsor, Canada, assignor to Simnar, Inc., Windsor, Canada

Filed Nov. 22, 1985, Ser. No. 800,699
Int. Cl.[4] A22C *25/02*
U.S. Cl. 17—64 7 Claims



1. In a fish scaling machine having a framework, a horizontally disposed conveyor adapted to supportably receive one side of a fish longitudinally movable thereover, a power drive, a series of longitudinally spaced first, second and third descaler rolls journaled upon the frame on axes at right angles to the direction of feeding, adapted to operatively engage said one side of said fish removing the scales therefrom as the fish are fed successively and continuously thereover, and a hold down and guide mechanism mounted upon the framework along said conveyor operatively and yieldably engaging the other side of the fish;

an improved first descaler roll comprising a drive shaft journaled upon said framework and connected to said power drive;

a pair of engaging cylindrical roller bodies with right angular end faces mounted end to end upon said drive shaft;

a radial set screw on each body in operative frictional and retaining engagement with said drive shaft;

generally parallel helical teeth on and around and projecting from each roller body;

the teeth of each body being inclined rearwardly toward each other and at an acute angle to said drive shaft;

said teeth at their one ends extending to one end face of each roller body, and at their other ends having axial projections outward of their other end faces;

the teeth extensions of one roller body overlying the other roller body, and extending between and interlocked with the adjacent teeth of the other roll at their engaging end faces.

4,624,032

SLIDE FASTENER SLIDER WITH DETACHABLE PULL TAB

Susumu Ishii, Kurobe, and Kiyoshi Oda, Namerikawa, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,151
Claims priority, application Japan, Oct. 16, 1984, 59-156098[U]
Int. Cl.[4] A44B *19/26*
U.S. Cl. 24—429 7 Claims

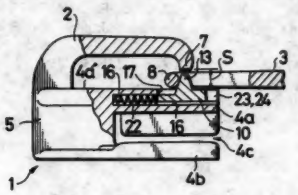
1. A slider for a slide fastener having a pair of opposed coupling element rows, comprising:

(a) a slider body including upper and lower wings joined at their front ends by a neck so as to define a Y-shaped guide channel between said upper and lower wings for the passage of the opposed coupling element rows;

(b) an arch-shaped lug projecting from the front end of said upper wing over a top surface of said upper wing and terminating in a rear free end directed toward said top surface of said upper wing and spaced therefrom by a predetermined gap;

(c) a pull tab threaded onto said arch-shaped lug for pivotal movement relative to said slider body and having a pintle;

(d) a slide slidably mounted in said upper wing and having a closure projection, said slide being movable longitudinally of said slider body between an open position in which said closure projection is spaced from said rear free end of said arch-shaped lug so as to allow said pintle of said pull tab to pass through said gap, and a closed position in which



said closure projection is disposed adjacent to said rear free end of said arch-shaped lug to prevent said pintle of said pull tab from passing through said gap; and

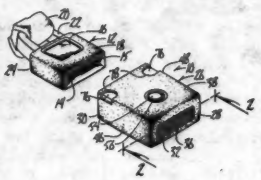
(e) a spring mounted in said upper wing to normally urge said slide toward said closed position.

4,624,033

CHILD SAFETY SEATBELT SECUREMENT DEVICE

Dale W. Orton, R.R. 2 Box 21, Elkhorn, Nebr. 68022

Filed Oct. 15, 1985, Ser. No. 787,661
Int. Cl.[4] A44B *17/00*
U.S. Cl. 24—633 14 Claims



1. A child safety seatbelt securement device for use with a female seatbelt buckle of the type having an opening in one end for receiving a male seatbelt buckle therein and a depressible release button on the top surface thereof, said device comprising,

a housing adapted for at least partially covering the release button of a female seatbelt buckle whereby direct access to the release button is substantially restricted, said housing having open opposite ends for permitting access to the female seatbelt buckle opening through one end and for passage of a seatbelt through the opposite end,

said housing comprising an open bottomed channel member engageable over the top surface of a female seatbelt buckle and having side edges depending on each side of said female seatbelt buckle,

means for securing said housing onto a female seatbelt buckle comprising strap means affixed at one end to one side edge of said channel member and engageable with the underside of a female seatbelt buckle and the other end releasably attached to the opposing side edge of said channel member, said strap means being releasable and attachable by an adult, and

actuator means on said housing and actuatable by an adult for depressing the release button of a female seatbelt buckle on which said housing is secured.

4,624,034

BUCKLE APPARATUS

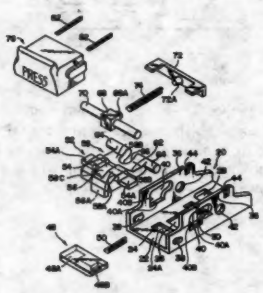
Kazuyoshi Ishiguro, and Hidemoto Araki, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-rika-denki-seisakusho, Aichi, Japan

Filed Oct. 22, 1985, Ser. No. 790,213

Claims priority, application Japan, Oct. 23, 1984, 59-160014[U]

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—641 21 Claims



1. A buckle apparatus employed in a seatbelt system designed to protect an occupant of a vehicle in an emergency situation of the vehicle, said apparatus being used for engagement with a tongue plate connected to an occupant restraining webbing when the occupant fastens said webbing, and said apparatus comprising:

(a) a buckle body mounted on the vehicle body for receiving said tongue plate;

(b) a lock plate inserted into an opening formed in said tongue plate when inserted into said buckle body in such a manner that the distal end of said lock plate projects out to the other side of said tongue plate, said lock plate being supported by said buckle body at portions on both sides of the portion which is received in said opening; and

(c) regulating means which allows at least one of said pair of support portions of said lock plate which support it on said buckle body to be separated from said buckle body when the force applied to said tongue plate such as to pull out said tongue plate from said buckle apparatus is relatively small, but which is formed of a flexible material which engages with said buckle body by elastic deformation when said force is relatively large, whereby when the vehicle is in a normal state, it is possible to disengage said lock plate from said tongue plate with a relatively small force, and when the vehicle runs into an emergency situation, said lock plate is supported by said buckle body at both sides of the portion of said lock plate which abuts against the edge of said opening of said tongue plate, thus resisting any relatively large force acting on said tongue plate in such a manner that said tongue plate would be undesirably pulled out of said buckle apparatus without said support of said lock plate.

4,624,035

PROCESS FOR THE PRODUCTION OF A BELT LOCK FOR A SAFETY BELT

Franz Wier, Goggingen, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

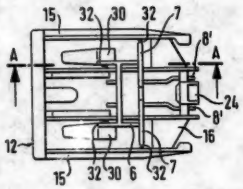
Filed Aug. 24, 1984, Ser. No. 644,046

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331435

Int. Cl.[4] A44B *11/26*

U.S. Cl. 24—642 7 Claims

1. An apparatus for use in a safety belt buckle having a base plate and a latch member engagable with a tongue, said apparatus comprising latch guide means engagable with the base plate for guiding movement of the latch member relative to the base plate, actuator means for moving the latch member relative to the base plate from an engaged condition holding the tongue against movement relative to the base plate and a disengaged



condition in which the latch member is ineffective to hold the tongue against movement, and frangible connection means for connecting said actuator means with said guide means to form a one-piece unit and for breaking upon the application of force to said actuator means to move said actuator means relative to said guide means.

4,624,036

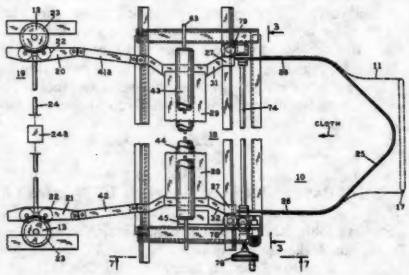
AUTOMATIC ORIENTATION GUIDE FOR TUBULAR KNITTED FABRIC

Edmund A. Diggle, Jr., Oradell, N.J., and Andrew P. Cecere, Valley Stream, N.Y., assignors to Samcoe Holding Corporation, Woodside, N.Y.

Division of Ser. No. 357,972, Mar. 15, 1982, Pat. No. 4,517,712. This application Jan. 28, 1985, Ser. No. 695,474

Int. Cl.[4] D06C *5/00;* D06H *3/12*

U.S. Cl. 26—51.4 13 Claims



1. Apparatus for processing tubular knitted fabric having a longitudinally extending edge demarcation, which comprises

(a) a first spreader frame section having an entry end and a discharge end,

(b) an orienting roller externally engageable with fabric on said first spreader frame section,

(c) means for controllably driving said orienting roller,

(d) means for adjustably angularly positioning said orienting roller relative to the longitudinal axis of said first spreader frame section, whereby to impart a rotational component of movement to tubular knitted fabric passing over said first spreader frame section, for orienting said edge demarcation at or near the edge extremity of the fabric on said spreader frame section, and

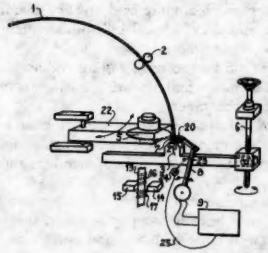
(e) a second spreader frame section immediately downstream of said first spreader frame section for receiving and further laterally distending said fabric.

4,624,037

APPARATUS AND PROCESS FOR THE CONTINUOUS PRODUCTION OF CAPACITORS OF THE STACKED TYPE

Jean Anne; Claude Roy, and Daniel Fleuret, all of Bagnolet, France, assignors to LCC Cice Compagnie Europeenne de Composants, Bagnolet, France

Continuation of Ser. No. 449,696, Dec. 14, 1982, abandoned.
This application Oct. 7, 1985, Ser. No. 783,811
Claims priority, application France, Dec. 31, 1981, 81 24583
Int. Cl.[4] H01G *32/00*
U.S. Cl. 29—25.42 13 Claims



1. A process for the continuous production of stacked type capacitors comprising the steps of:

(a) making a parallelepipedic mother capacitor by simultaneously winding on a wheel a pair of metallized dielectric films,

(b) respectively connecting odd and even metallized layers of the mother capacitor by spraying molten metal on the lateral faces thereof,

(c) gripping said laterally sprayed faces of an end portion of said mother capacitor with a pair of gripper jaws, each jaw of said pair of gripper jaws engaging a respective one of said laterally sprayed faces,

(d) sawing said end portion from the mother capacitor to thereby form an individual capacitor while maintaining the gripping thereof according to step (c),

(e) transfering said individual capacitor by means of the gripper jaws towards a soldering station for soldering electrical connecting wires while simultaneously, during transfer thereof to said soldering station, electrically testing the parameters of the individual capacitor by means of electrical signals fed across the pair of gripper jaws, said electrical testing being initiated when the sawing operation acording to step (d) is completed and before soldering the connecting wires is started,

(f) placing the individual capacitor between the arms of a hairpin-type connecting wire mounted on a perforated strip, said arms being situated opposite the laterally sprayed faces of the individual capacitor, and

(g) soldering said arms on said sprayed faces, said pair of gripper jaws thereafter returning to grip the laterally sprayed faces of the mother capacitor.

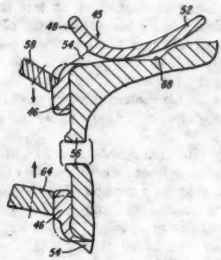
4,624,038

METHOD OF PRODUCING MOTOR VEHICLE WHEELS

William D. Walther, 267 Stonehaven Rd., Dayton, Ohio 45429

Filed Sep. 16, 1983, Ser. No. 532,745
Int. Cl.[4] B21H *1/02*
U.S. Cl. 29—159.01 4 Claims

1. An improved method of producing a motor vehicle wheel adapted to receive an inflatable tire, comprising the steps of forming a heat treatable light weight metal alloy into an annular preform having an annular disc portion projecting inwardly from a first annular wing portion and a second annular wing portion projecting axially in opposite directions from the disc portion, mounting the preform on a rotatable mandrel having a predetermined generally radial surface, pressing a forming roller axially into the disc portion in contact with the mandrel surface while the preform and mandrel are rotating, engaging the disc portion with a pressure roller disposed radially inwardly of the forming roller and spaced circumferentially from the forming roller engaging the disc portion, moving both the forming roller and the pressure roller radially inwardly and simultaneously towards the axis of the preform to shear-form and extrude the disc portion inwardly into a thinner and radially wider disc portion, positioning the preform with the disc



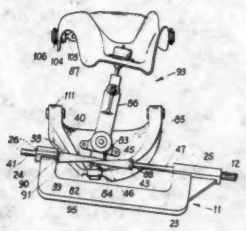
portion between rotatable mandrels having predetermined contoured peripheral surfaces spaced radially inwardly from the wing portions, pressing a forming roller inwardly into each wing portion of the preform while the mandrel and preform are rotating and while moving the forming roller away from the disc portion along a predetermined path to press each wing portion against the peripheral surface of the corresponding mandrel and to shear-form the wing portion into a thinner and wider rim portion conforming to the contoured peripheral surface of the corresponding mandrel, and removing the shear-formed disc portion and rim portions from the mandrels.

4,624,039

UNIVERSAL SUSPENSION TOOL

Manuel Lawrence, 32 Lanovette St., Meriden, Conn. 06450, and Alfred Gonsalves, Evergreen La., Prospect, Conn. 06712

Filed Aug. 27, 1985, Ser. No. 769,687
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—257 1 Claim



1. A front suspension tool having particular utility for facilitating the removal and/or installing of ball joints, tie-rods and bushings, comprising:

a suspension press means (11) having a first mounting socket (24) and a second mounting socket (25), said first mounting socket having a tapered hole (26), said second mounting socket having an elongate hole (28) and threaded wall portions (36) defining a portion of said elongate hole (28);

pusher bolt means (12) having a bolt head (33), an intermediate portion (32) having threads (36) for matingly engaging

said threaded wall portions of said second mounting socket, and having a pusher head member (31);

first interchangeable attachment means (27) having a bifurcated wedge member (38) with an inclined surface portion (39) and a flat surface portion (40), and having an elongate shaft (41), said elongate shaft being dimensioned for being insertable within said first socket hole (26) and within said second socket hole (28);

second interchangeable attachment means (30) having a bifurcated wedge member (43) with an inclined surface portion (45) and a flat surface portion (46), and having an elongate shaft (47), said elongate shaft being dimensioned for being insertable within said first socket hole (26) and within said second socket hole (28);

third interchangeable attachment means (15) having a body portion (54), and having a pair of spaced apart off-set bracing members (56,57), and having an elongate shaft means (72) dimensioned for being insertable within said first socket hole (26) and within said second socket hole (28);

fourth interchangeable attachment means (16) having an adjustable wrench head member (53) and an elongate shaft (58), said head member (53) having a thumb wheel adjustment means (59) and a fixed gripper arm (60) and an adjustable gripper arm (61) being movable with actuation of said adjustment means (59), said elongate shaft (58) being dimensioned for being insertable within said first socket hole (26) and within said second socket hole (28);

fifth interchangeable attachment means (17) having a collar member (62) defining a cavity (99) and having a shaft member (64) dimensioned for being within said first socket hole (26) and within said second socket hole (28);

sixth interchangeable attachment means (18) having a collar (67) and an elongate shaft, said elongate shaft being dimensioned for being insertable within said first socket hole (26) and within said second socket hole (28);

seventh interchangeable attachment means (20) having a collar (75) and a shaft member dimensioned for being mountable between said fixed gripper arm (60) and said adjustable gripper arm (61); and

eighth interchangeable attachment means (22) having a spacer collar (81) and an adjustment means (80);

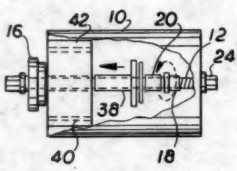
such that each of said attachment means (27,30,15,16,17,18,20,22) being selectively demountably mounted to said suspension press means.

4,624,040

FRONT WHEEL BEARING PUSHER

Alex Sabo, 2147 Hartford Way, Clearwater, Fla. 33575

Filed May 28, 1985, Ser. No. 737,683
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—258 **5 Claims**



1. A device for removing and installing hubs and wheel bearings on front wheel drive vehicles, comprising:

a frame means in the form of a cylindrical hollow housing member;

said housing member having a first, imperforate end wall that is centrally apertured;

said housing member having a second end that is open;

said housing member having a cylindrical in configuration side wall that extends only paritally around said frame means, said side wall defining a "C" shape when seen in end elevation;

said housing member having an access opening that extends between said first end wall and said second open end, said opening being defined by the open portion of said "C"-shaped side wall;

an elongate rod member having a non-circular head engageable by a tool means;

said rod member being threaded along its extent;

said rod member having a distal end opposite from its head end;

said distal end operative to screw threadedly engage the central aperture formed in said first end wall;

a hub removal means including said housing member, said rod member, and a cylindrical hub pusher member that receives said rod member;

a wheel bearing removal means including said housing member, said rod member, and a bearing pusher member that receives said rod member;

a wheel bearing installation means including said housing member, said rod member, said bearing pusher member, a bearing stopper member, a push nut member, and a guide lock nut member;

a hub installation means including said housing member, said rod member, said bearing stopper member, said push nut member, a hub installer member, and said guide lock nut member;

said rod member being rotated about its axis of rotation when said device is employed to remove a hub or a bearing;

said rod member being held against rotation by said guide lock nut member when said device is employed to install a hub or a bearing;

said hub pusher member and said bearing pusher member advancing in a first direction, toward said first end wall, to remove a hub or a bearing responsive to rotation of said rod member;

said bearing pusher member and said hub installer member advancing in a second, opposite direction, toward said second open end, to install a hub or bearing responsive to non-rotation of said rod member and axial travel of said push nut member in said second direction;

and said bearing stopper member preventing axial displacement of a hub or bearing housing responsive to advancement of said push nut member;

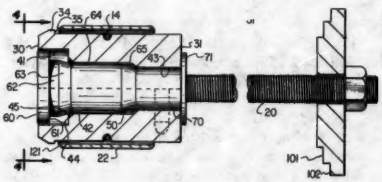
whereby four different functions can be performed by only eight parts and whereby the position of said housing member is the same during the performance of all of said functions.

4,624,041

SLEEVE BEARING PULLER

John B. Gathright, and Grady C. Gathright, both of Smackover, Ark., assignors to Gathright Puller, Inc., Smackover, Ark.

Filed Oct. 21, 1985, Ser. No. 789,620
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—263 **8 Claims**



1. A sleeve bearing puller comprising:

a plurality of expandable and contractable sleeve extractors

each having an external sleeve pulling flange and internal longitudinally spaced tapered cam surfaces and cylindrical holding surfaces;

an expander mandrel within said extractors for longitudinal movement therein, said mandrel having a pulling shoulder and longitudinally spaced tapered cam surfaces and cylindrical holding surfaces engageable with said internal surfaces in said extractors for expanding and holding said extractors in lateral parallel spaced relation for engaging and pulling a sleeve bearing; and

a resilient retainer around said extractors holding said extractors on said mandrel for expansion and contraction responsive to longitudinal movement of said mandrel within said extractors.

4,624,042

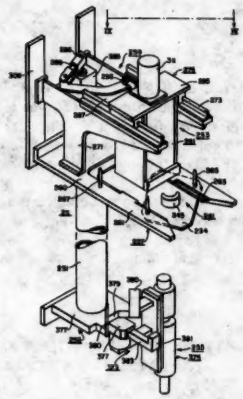
ROBOTIC CLAMP AND INDEX TOOL AND METHOD FOR THEIR USE IN REPAIRING CERTAIN ELEMENTS WITH IN A NUCLEAR REACTOR

Richard A. Green, Farmington Hills, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1984, Ser. No. 617,859

Int. Cl.[4] B23P *19/04*; B25J *15/00*; G21C *19/00*

U.S. Cl. 29—402.08 **25 Claims**



1. A clamp-and-index tool for use in the replacement of old split-pin assemblies of a guide tube of a nuclear reactor by new split-pin assemblies, said old split-pin assemblies and said guide tube being radioactive and said clamp-and-index tool to operate under a pool of water, the said tool including means, to be connected to said guide tube, for suspending said guide tube in a first position in which said tube is to be processed to effect said replacement, means, connected to said suspending means, for rotating said guide tube to a second position in which said tube is to be processed to effect said replacement and clamping means, connected to said suspending means and to be connected to said guide tube, for selectively clamping said guide tube in said first or second position.

6. A clamp-and-index tool for use in replacing the old split-pin assemblies of a guide tube of a nuclear reactor with new split-pin assemblies, said old split-pin assemblies and said guide tube being radioactive and said clamp-and-index tool operating under a pool of water, the said guide tube to be transferred by a crane from said reactor to said tool, the said tool including means, accessible to said crane, to be connected to said guide tube, for temporarily positioning said guide tube on said tool in a first position, means, to be connected to said guide tube, for removing said guide tube from said temporary positioning means and positioning said guide tube in a second position in which said guide tube is to be processed to effect said replacement, and means to be connected to said guide tube, for clamping said guide tube in said second position.

10. A clamp-and-index tool for use in the replacement of old split-pin assemblies of a guide tube of a nuclear reactor by new split-pin assemblies, said guide tube and said old split-pin assemblies being radioactive, and said clamp-and-index tool to operate under a pool of water, the said tool including means, to be connected to said guide tube, for positioning said guide tube in position to be processed for replacing said old split-pin assemblies, and clamping means selectively operable, to be connected to said guide tube, for clamping said guide tube is said processing position.

11. A clamp-and-index tool for use in the replacement of old split-pin assemblies of a guide tube of a nuclear reactor by new split-pin assemblies, said guie tube and said old split-pin assemblies being radioactive, and said clamp-and-index tool to operate under a pool of water, the said tool including means, to be connected to said guide tube, for positioning said guide tube in position to be processed for replacing said old split-pin assemblies, and clamping means, selectively operable, to be connected to said guide tube, for clamping said guide tube in said processing position, the said clamping means including a clamping assembly having fixed pad means and a movable clamping jaw for clamping said guide tube between said clamping jaw and said pad means, and fluid-operable cam means, connected to said clamping jaw, for moving said jaw into and out of clamping relationship with said guide tube.

13. A clamp-and-index tool for use in the replacement of the old split-pin assemblies of a guide tube of a nuclear reactor by new split-pin assemblies, said guide tube and said old split-pin assemblies being radioactive, said clamp-and-index tool operating under a pool of water, the said tool including means, to be connected to said guide tube, for positioning said guide tube for processing to replace said old split-pin assemblies, means, to be connected to said guide tube, for centering said guide tubes for processing, and means, to be connected to the guide tube, cooperative with the centering means for clamping the guide tube, as centered for processing.

4,624,043

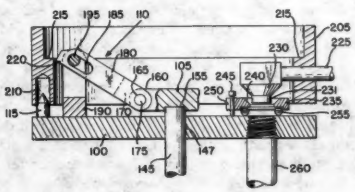
QUICK RELEASE TOOL HOLDER FOR ROBOTS

David M. Bennett, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1982, Ser. No. 427,243

Int. Cl.[4] B23Q *3/155*

U.S. Cl. 29—568 **21 Claims**



1. A tool holder, comprising:

a base plate having an outwardly facing surface upon which a tool may be mounted,

a plurality of support posts coupled to said base plate,

a plurality of lever arms each having a radially inner end, and each having a radially outer end which is capable of engaging an outwardly facing engagement surface on said tool,

means for pivotally connecting said lever arms to said posts adjacent to one end of said lever arms such that the connection point there between translates laterally with respect to one of said lever arms and said base plate,

a link translatable in either direction along a common axis,

means for pivotally connecting each of said lever arms to said link adjacent to the inner end of said lever arms, and

means for translating said link along said axis, whereby when said link is translated along one direction, said lever arms pivot and translate outwardly out over said engagement surface of said tool, and engage said tool with a force that is applied parallel to said axis and towards said base plate, and when said link is translated along another direction, said lever arms pivot and translate radially inward to disengage from said tool.

4,624,044

ARRANGEMENT FOR STORING AND EXCHANGING OF TOOLS IN A POWER TOOL PARTICULARLY A REVOLVING CUTTING PRESS

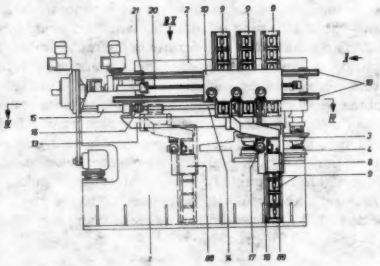
Walter Bredow, and Albert Schwarze, both of Alfeld, Fed. Rep. of Germany, assignors to C. Behrens AG, Alfeld, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,917

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335330

Int. Cl.[4] B23Q *3/155*

U.S. Cl. 29—568 **32 Claims**



1. A revolving cutting press, comprising at least one revolving plate; a tool exchange device; a plurality of elongated rectilinear magazine cassettes and a cassette magazine, each of said magazine cassettes being provided with a plurality of receiving units arranged rectilinearly in a row and adapted for containing tool sets useable in said at least one revolving plate, said cassette magazine being formed for receiving said magazine cassettes arranged parallel to one another, said tool exchange device being arranged for receiving each of said magazine cassettes, said tool exchange device having a loading head cooperating with a respective one of said receiving units for fixing and displacement of a tool set in a direction towards and away from said revolving plate, said tool exchange device being provided with means for arresting and stepped displacement of said magazine cassettes in its longitudinal direction, said cassette magazine being formed so as to transfer any of said magazine cassettes to said tool exchange device.

4,624,045

METHOD OF MAKING THIN FILM DEVICE

Shinichiro Ishihara, Hirakata; Takashi Hirao, Moriguchi; Koshiro Mori, Osaka; Masaharu Ono, Higashiosaka, and Masatoshi Kitagawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 418,002, Sep. 14, 1982, abandoned. This application Mar. 27, 1985, Ser. No. 716,604

Claims priority, application Japan, Sep. 26, 1981, 56-152751

Int. Cl.[4] H01L *31/18, 27/14*

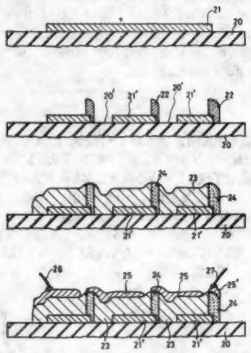
U.S. Cl. 29—572 **2 Claims**

1. A method for forming an array of series-connected thin film devices comprising the steps of:

forming a plurality of spaced apart conductive first electrodes on an insulative substrate,

forming a corresponding plurality of diffusion metal sources each of which is in contact with a respective one of said first electrodes, selective portions of the surface of said diffusion metal sources being oxidized to selectively prevent diffusion therefrom,

forming a thin film of semiconductive material on said conductive first electrodes and insulative substrate,



diffusing metal from each of said diffusion metal sources into said thin film thereby to produce diffused regions in said thin film at the same time as said forming of said thin film in a manner such that said diffused regions reach the remote surface of said thin film during said forming of said thin film, and

forming a plurality of spaced apart conductive second electrodes on the surface of said thin film and said diffused regions,

thereby forming electrical connections between said first electrodes and said second electrodes.

4,624,046

OXIDE ISOLATION PROCESS FOR STANDARD RAM/PROM AND LATERAL PNP CELL RAM

Jay A. Shideler, San Mateo, and Umeshwar D. Mishra, Sunnyvale, both of Calif., assignors to Fairchild Camera & Instrument Corp., Cupertino, Calif.

Continuation of Ser. No. 336,802, Jan. 4, 1982, abandoned. This application Aug. 27, 1985, Ser. No. 770,355

Int. Cl.[4] H01L *21/265, 29/72, 21/225*

U.S. Cl. 29—576 B **8 Claims**

1. The method of forming a semiconductor device comprising:

forming in a semiconductor substrate of a first conductivity type a plurality of first regions of a second conductivity type adjacent to the top surface thereof, said second conductivity type being opposite said first conductivity type, said first regions of said second conductivity type being highly doped to provide a low resistivity to the passage of current;

forming an epitaxial layer of said second conductivity type on said substrate to a selected thickness, said first regions out-diffusing from said substrate into portions of said epitaxial layer during the growth of said epitaxial layer;

forming grooves in selected portions of said epitaxial layer;

forming channel stop regions of said first conductivity type in the bottom surfaces of said grooves, said channel stop regions of said first conductivity type having a higher dopant concentration than said substrate;

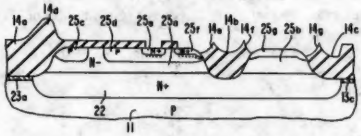
thermally oxidizing the epitaxial material exposed by said grooves, thereby to form regions of thermal oxide in said grooves, said regions of thermal oxide extending through

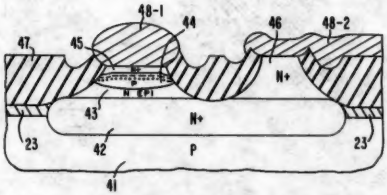
said epitaxial layer into contact with said substrate thereby to form from said epitaxial layer a plurality of islands of semiconductor material, the lateral dimensions of each of said islands being defined by said regions of thermal oxide;

forming at least a first vertical transistor in a first one of said islands of semiconductor material and a second vertical transistor in a second one of said islands, said forming at least a first and a second vertical transistor comprising,

forming a first region of said first conductivity type in said first island, a first portion of said first region serving as a first active base region of said first vertical transistor, and forming a first active base region of said first conductivity type in said second island serving as a first active base region of said second vertical transistor, the lateral extent of said first active base region of said first transistor being partially defined by a first portion of said thermal oxide, the lateral extent of said first active base region of said second vertical transistor being completely defined by a second portion of said thermal oxide,

etching portions of the region of said thermal oxide adjacent said first base regions of said first and said second vertical transistors so as to expose additional portions of said semiconductor material in said first and second islands respectively,





forming a first emitter region of said second conductivity type in said first active base region of said first transistor and a first emitter region of said second conductivity type in said first active base region of said second transistor, the lateral extent of said first emitter region of said first transistor being partially defined by said first portion of said thermal oxide, and the lateral extent of said first emitter region of said second transistor being completely defined by said second portion of said region of thermal oxide,

ion implanting second active base regions beneath said first emitter regions of said first and said second vertical transistors and along said thermally grown oxide adjacent said first active base regions of said first and said second vertical transistors in order to increase the separation between said emitter regions and said collector regions adjacent said first and said second oxide positions respectively, in order to prevent I_{CEO} leakage,

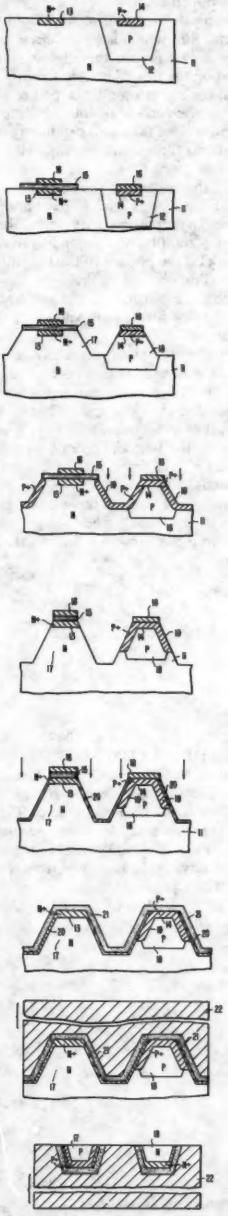
ion implanting a third active base region beneath said first emitter region of said second vertical transistor so that the beta of said second vertical transistor with said third active base region is less than the beta of said first vertical transistor and so that the collector-emitter breakdown voltage with base open of said second vertical transistor with said third active base region is greater than the collector-emitter breakdown voltage with base open of said first vertical transistor, thereby to form a junction programmable transistor.

4,624,047

FABRICATION PROCESS FOR A DIELECTRIC ISOLATED COMPLEMENTARY INTEGRATED CIRCUIT

Satoru Tani, Aizuwakamatsu, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 11, 1984, Ser. No. 659,962
Claims priority, application Japan, Oct. 12, 1983, 58-191181
Int. Cl.[4] H01L *21/76, 21/302, 21/38*
U.S. Cl. 29—576 W 8 Claims



1. A method for fabricating dielectric isolated regions for a

complementary IC starting with a substrate of a first conductivity type, comprising the steps of:

(a) providing a well of a second conductivity type in the substrate;

(b) providing a first highly doped region of the first conductivity type in the substrate and a second highly doped region of the second conductivity type in the well;

(c) covering the first highly doped region and a portion of the substrate with a first film which is larger than the first highly doped region;

(d) covering the first and second highly doped regions with a second film which is equal in size to the pattern of each highly doped region therebelow, the second film being formed on the first film over the first highly doped region and on the second highly doped region;

(e) etching the surface of the substrate not covered by the first and second films and producing islands under the first and second films which project above the surface of the substrate;

(f) doping the surface of the substrate and the exposed portions of the islands with a first impurity having a second conductivity type impurity and a first diffusion coefficient, using the first and second films as a mask;

(g) etching off the portion of the first film not covered by the second film;

(h) etching the portion of the substrate which is exposed when the first film is removed instep (g) and reshaping the islands;

(i) doping the surface of the substrate and the exposed portion of the islands with a second impurity having a first conductivity type impurity and a second diffusion coefficient smaller than the first diffusion coefficient, using the second film as a mask;

(j) removing the first and second films;

(k) forming a third film over the surface of the substrate and the islands;

(l) growing a poly-silicon layer over the surface of the substrate and the islands; and

(m) removing the substrate leaving the islands in the poly-silicon layer.

4,624,048

METHOD OF MAKING MAGNETIC HEAD SLIDERS

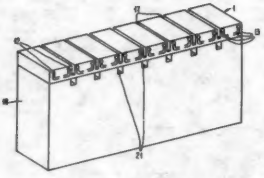
Holger Hinkel, Boeblingen; Gerhard Kaus, Moetzingen; Ulrich Kuenzel, Kusterdingen, and Gerhard Schmid, Leinfelden-/Echterdingen, all of Fed. Rep. of Germany, assignors to International Business Machines, Armonk, N.Y.

Filed Aug. 6, 1984, Ser. No. 638,314

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 83108126[U]

Int. Cl.⁴ G11B *5/42*

U.S. Cl. 29—603 **7 Claims**



1. The method for making magnetic head sliders out of a flat workpiece of highly pure aluminum whose first longitudinal surface corresponds, in its dimension that is normal to the length of the workpiece, to the length of the magnetic head slider, and whose second longitudinal surface that is normal to the first longitudinal workpiece surface is equipped with at least one magnetic head having its field line entry and exit surfaces flush with the first longitudinal workpiece surface, said method comprising the steps of:

anodically oxidizing a predetermined area of said first longitudinal workpiece surface extending in the direction of the length of the magnetic head slider to form an anodic oxidation aluminum oxide layer, said predetermined area extending along the edges of said magnetic head sliders and having the shape required to form rail surfaces;

etching said workpiece, using said anodically oxidized layer as a mask, to form recessed regions of predetermined depth and simultaneously form rails of the same configuration as said rail surfaces; and

lapping said rail surfaces to give a surface finish defined by a predetermined peak-to-valley height so that said rails and said recessed region produce a predetermined flight height when said magnetic head slider is positioned adjacent a moving magnetic medium.

4,624,049

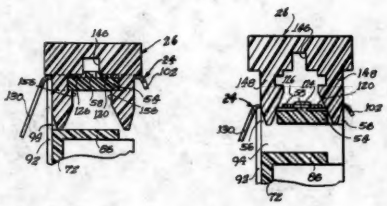
SWITCH ACTUATOR ASSEMBLY

Fred Levko, Evanston, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 23, 1985, Ser. No. 737,111

Int. Cl.⁴ H01H *11/06*

U.S. Cl. 29—622 **4 Claims**



1. The method of producing a switch actuator assembly which comprises providing an insulating base having first severing means thereon, assembling a sheet metal switch contact assembly with said base, said switch contact assembly having electrically conductive first and second switch contact means integrally interconnected by a severable area, positioning said switch contact assembly with said severable area adjacent said first severing means, and assembling insulating retainer means with said base and said switch contact assembly, said retainer means including second severing means, and during assembly of said retainer means with said base and said switch contact assembly utilizing said first and second severing means to sever said severable area electrically to isolate said first and said second switch contact means from one another.

4,624,050

HEAD FOR HANDLING ELECTRICAL COMPONENTS

Victor T. Hawkswell, Witham, England, assignor to USM Corporation, Farmington, Conn.

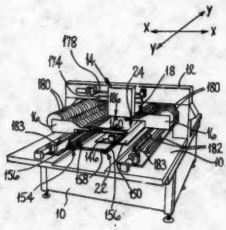
Filed Sep. 12, 1985, Ser. No. 776,972

Int. Cl.⁴ B65G *47/91*; H05K *13/02*

U.S. Cl. 29—740 **23 Claims**

1. A head for handling electrical components comprising a tool holder, means for moving the holder between a plurality of datum positions and further positions remote therefrom, the holder having means for interchangeably mounting a tool with

a datum face thereof positioned at a predetermined position relative to the tool holder, the head further comprising a plurality of orienting jaws mounted for movement towards and away from a component carried by and abutting the datum face of a tool mounted on the tool holder when the holder is in one of the datum positions whereby to engage and orient a



component carried by the tool, the jaws having a plurality of spaced sets of cooperating datum faces generally transverse to the plane of the datum face of a tool in the holder, each set of datum faces of the jaws being so disposed as to be capable of orienting a component carried by a tool mounted on the tool holder when the holder is at a corresponding one of said datum positions.

4,624,051

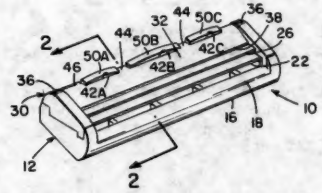
SHAVING UNIT

Domenic V. Apprille, Jr., Arlington; Ralph J. Chesnauskas, Peabody; Chester F. Jacobson, Southboro, and Robert A. Trotta, Pembroke, all of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Dec. 7, 1984, Ser. No. 679,258

Int. Cl.[4] B26B *21/00, 19/40, 21/14*

U.S. Cl. 30—50 **27 Claims**



1. A razor having a razor blade and support structure that define external skin engaging surfaces in front of and to the rear of the cutting edge of said blade,

a through aperture in one of said skin engaging surfaces that has a seat surface adjacent an internal edge of said aperture,

a shaving aid member that includes an effective amount of a water-leachable shaving aid composition that has a body portion of shape corresponding to said aperture, and a tab portion at the base of said body portion that extends laterally outwardly from said body portion, the body of said shaving aid member being disposed in said aperture and an upper surface of said body portion protruding above said external skin engaging surface and structure in mechanical engagement with the base of said shaving aid member that firmly seats said tab portion against said internal seat surface of said support structure.

4,624,052

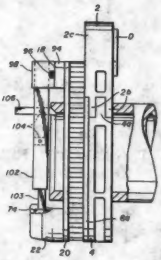
PIPE CUTTER WITH ENCLOSED FEED MEANS

Carlos M. Garcia, 225 Sunnyside St. Apt. 15, Bldg. 14, Houston, Tex. 77076, and Dale K. McLeod, 5926 Pinewilde, Houston, Tex. 77066

Continuation-in-part of Ser. No. 439,411, Nov. 5, 1982, Pat. No. 4,493,150. This application May 4, 1983, Ser. No. 491,435

Int. Cl.[4] B23D *21/04;* **B26D** *3/16*

U.S. Cl. 30—97 **5 Claims**



1. An apparatus for cutting pipe comprising a split frame ring;

means for attaching the split frame ring to the pipe;

bearing means attached to the split frame ring;

a split carrier ring which is rotatably mounted by the bearing means to the split frame ring;

drive means for rotating the split carrier ring about the split frame ring;

a cutter arm;

means for pivotally attaching the cutter arm to the carrier ring so that the cutter arm can be adjusted to cut pipe of various sizes;

a bridge member;

means for movably attaching one end of the bridge member to the cutter arm and one end of the bridge member to the split carrier ring so that the bridge member can move radially relative to the pipe;

a cutting tool mounted to the bridge member; and

feeding means for automatically converting the rotational movement of the split carrier ring relative to the split frame ring into movement of the bridge member in the radial direction, said feeding means being mounted completely interior of the outer periphery of the split carrier ring and the split frame ring and completely exterior of the inner periphery of the split carrier ring and the split frame ring, said feeding means being activated by rotation of the split carrier ring about the split frame ring, said feeding means being completely enclosed within the cutter arm, the split carrier ring and the split frame ring.

4,624,053

SAW

Mats Danielsson, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Division of Ser. No. 578,367, Feb. 7, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 816,302

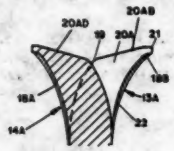
Claims priority, application Sweden, Feb. 7, 1983, 8300611

Int. Cl.[4] B23D *45/00;* **B27B** *5/29*

U.S. Cl. 30—166 R **1 Claim**

1. A saw comprising a series of punch-formed generally V-shaped teeth of substantially the same height, alternating ones of said teeth displaced outwardly in opposite directions, leading and trailing edges of said each tooth converging toward a point, at least said leading edge defining a cutting

edge and being beveled, and a continuous punch burr formed along substantially the entire length of each cutting edge and



projecting laterally from the plane of the tooth to facilitate penetration of the saw through material being cut.

4,624,054

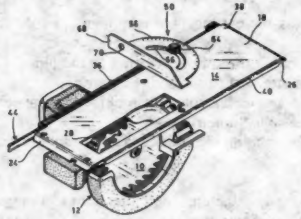
SAW GUIDE HAVING PIVOTAL PROTRACTOR MEANS

Gary L. Edwards, 896 Dunn St., Morristown, Tenn. 37814

Filed Aug. 7, 1985, Ser. No. 763,295

Int. Cl.[4] B27B *9/04*

U.S. Cl. 30—374 **14 Claims**



1. A saw guide for controlling the path/direction of travel, with respect to a selected reference on an object such as a board to be cut, of a rotary or jig saw blade during cutting operations, said guide being secured to the base plate of a rotary or jig blade type saw and including:

a carriage having upper and lower substantially planar surfaces and defining first and further longitudinal edge portions, a forward edge portion and a rearward edge portion, said carriage defining an opening for receiving a rotary or jig saw blade therethrough, said carriage opening being proportioned for registering with at least a portion of an opening in such saw blade base plate upon mounting said carriage thereon;

sleeve means carried by said carriage proximate one longitudinal edge portion thereof, said sleeve means defining an elongated opening;

rod means slidably received within said opening in said sleeve means, said rod means defining first and further end portions;

travel control means for controlling the direction of travel of said saw from a reference defined on an object to be cut, said travel control means including protractor means rotatably mounted on said first end portion of said rod means, said protractor means including means for adjusting the rotational position of said protractor with respect to a longitudinal axis of said rod, and protractor face plate means which engages said reference from which the direction of travel of said saw is controlled; and

storage means for enabling pivotal movement of said protractor means from a position below said lower surface of said carriage to a location proximate the upper surface of said carriage such that the motion of said saw is not controlled by said guide and said saw can be used in its conventional manner as though said guide had been removed.

4,624,055

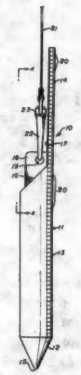
CONSECUTIVE READING GAUGING BOB

Don M. Foster, Florissant, Colo., assignor to Fostco, Inc., Florissant, Colo.

Filed Jun. 18, 1985, Ser. No. 745,938

Int. Cl.[4] G01B *3/00*; G01F *23/04*

U.S. Cl. 33—126.5 **24 Claims**



1. A continuous reading gauging bob releasably attachable to a measuring tape having graduations for measuring the contents of a storage compartment comprising

a generally cylindrical vertical elongated body having a measuring tape receiving means and an extended upper portion which overlaps the lower portion of the tape and the point of attachment of the bob thereto,

said tape receiving means comprising a projecting body portion having an aperture adapted to receive a snap hook secured on the bottom end of a measuring tape by a swivel connection for rotatably supporting said bob, and

graduations on the outer surface of said body and extended upper portion spaced relative to the graduations of the tape to form a continuous consecutive reading scale with the measuring tape when attached thereto.

4,624,056

SIGHT FORK FOR ALIGNING SIGHTS ON SMALL FIREARMS

Harry E. Moore, 5436 Spruce St., Philadelphia, Pa. 19139

Filed Apr. 3, 1985, Ser. No. 704,492

Int. Cl.[4] G01B *5/25*

U.S. Cl. 33—180 R **1 Claim**

1. A method for aligning the front and rear sights of a handgun, using a device comprised of a support block having a full section and a stepped section having prongs which form a

centered longitudinal slot therein and a stem extending from the upper center surface of the opposite end of the full section of said support block, comprising the steps of:

placing the prong-shaped stepped section adjacent the top surface of the gun barrel so that the centered longitudinal slot extends around the front blade sight so that said slot adjoins the front blade sight on three sides from the rear and placing the stem adjacent the top surface of the adjustable rear sight; and

adjusting the rear sight of said handgun laterally and vertically according to the alignment of the stem adjacent the top surface of the rear sight.

4,624,057

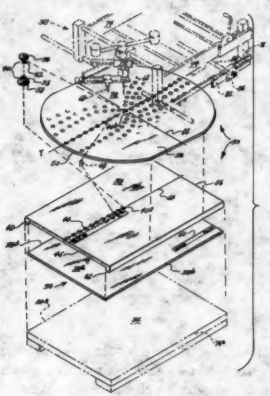
METHOD AND TEMPLATE FOR CIRCLE LAYOUTS

William A. Hursey, 502 West Canal St., Picayune, Miss. 39466

Filed Aug. 6, 1985, Ser. No. 763,017

Int. Cl.[4] B23Q *1/16*; B27C *5/10*

U.S. Cl. 33—570 **20 Claims**



1. An indexing template for positioning a work piece with respect to a tool comprising:

a. a base;

b. a lower plate slidably positioned upon the base;

c. an upper plate movably connected to the lower plate;

d. an ordered pattern of indexing points in the upper plate arranged upon a plurality of concentric circles of varying diameter;

e. an ordered pattern of indexing points in the lower plate; and

f. indexing means for affixing the upper and lower plates with respect to each other at preselected positions by alignment of indexing points in the lower plate with indexing points on a concentric circle in the upper plate.

4,624,058

FLUIDIZED-BED DRYER

Morihiro Nakayasu, Shizuoka; Takekazu Tomizawa, Fujieda, and Toshiharu Sugiura, Tokyo, all of Japan, assignors to Kabushiki Kaisha Okawara Seisakusho, Shizuoka, Japan

Continuation of Ser. No. 585,852, Mar. 2, 1984, abandoned. This application Nov. 19, 1984, Ser. No. 673,132

Claims priority, application Japan, Mar. 11, 1983, 58-41170

Int. Cl.[4] F26B *3/08*

U.S. Cl. 34—10 **2 Claims**

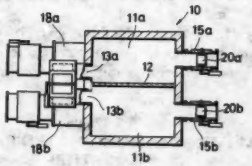
1. A process for drying feed containing a liquid comprising the steps of:

(1) introducing a portion of said wet feed into one first section of a vertical fluidized bed drying chamber having a horizontal porous supporting shelf;

(2) introducing hot air into said first section;

(3) exposing said portion of feed to said hot air to effect fluidization and drying thereof until the content of the liquid is reduced to a predetermined amount and a dried portion of feed is obtained;

(4) introducing a second portion of said wet feed into a second section of said vertical fluidized bed drying chamber having a horizontal porous supporting shelf;



(5) removing said dried portion of feed from said first section of the drying chamber;

(6) introducing hot air into said second section to effect drying of the second portion of said wet feed;

(7) introducing a new portion of said wet fed to said first section as in step (1), and removing the second portion of feed after completion of drying from the second section;

(8) repeating said steps (2)–(7) batchwise with successive portions of said wet feed to produce a semicontinuous drying process.

4,624,059

METHOD AND PLANT FOR COOLING PELLETS

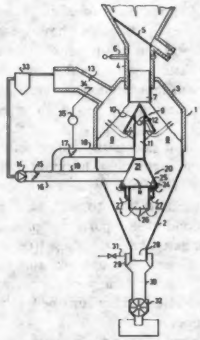
Björn Hammarskog, Sala; Göran Mathisson, and Sven Santén, both of Hofors, all of Sweden, assignors to SKF Steel Engineering AB, Hofors, Sweden

Filed Oct. 29, 1984, Ser. No. 666,198

Claims priority, application Sweden, Aug. 24, 1984, 8404220

Int. Cl.[4] F26B *3/16*

U.S. Cl. 34—20 **7 Claims**



1. A continuous method for cooling particulate material from a temperature of 700°–1000° C. to below 100° C. in a vertical cooling container comprising

(a) forming the particualte material flowing from a processing unit into a cone-shaped layer of substantially uniform thickness;

(b) passing a first portion of non-oxidizing cooling gas transversely through said layer from the interior to the exterior of said cone;

(c) as the particulate material flows downwardly through

said container, passing a second portion of non-oxidizing cooling gas upwardly through the material countercurrent to the direction of material flow;

(d) removing the non-oxidizing gas from said container at a point above said cone-shaped layer;

(e) discharging said cooled particulate material from the lower end of said container; and

(f) regulating the gas flows of said first and second portions in inverse proportion to each other responsive to the temperature of the gas leaving the container so that maximum temperature is obtained in the gas leaving the container; and

(g) regulating the total of the gas flows of said first and second portions in proportion to the quantity of cooled particulate material being discharged from said container.

4,624,060

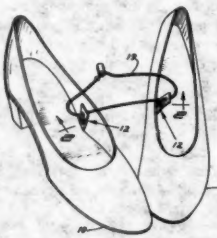
SYSTEM FOR ATTACHING MATED PAIRS OF SHOES TOGETHER

Susan M. Maxwell, 3640 Independence Ave. South, Apt. 50, St. Louis Park, Minn. 55426

Continuation of Ser. No. 539,663, Oct. 6, 1983, abandoned. This application May 8, 1985, Ser. No. 731,762

Int. Cl.[4] A43C *11/00*

U.S. Cl. 36—1 **4 Claims**



1. A system for attaching together mated pairs of shoes, which comprises in combination:

(A) a pair of shoes, each of which has an inner sole and an outer sole, each shoe also having a shoe upper with an inside surface and a top edge, each of said shoes further having a fastening tab and means for securing said tab between said inner and outer soles,

(1) said fastening tab being an integral sheet with two parts,

(2) the first of said parts comprising one end of the elongated tab extending horizontally between the inside surfaces of the outer sole and inner sole of the shoe and firmly secured thereto with said securing means,

(3) the second of said parts comprising the opposite end of the elongated tab extending from one edge of the inner sole and vertically upward along but spaced from the inside surface of the shoe upper and extending so that said opposite end remains beneath the top edge of said shoe upper,

(4) the second of said parts having an aperture in the form of a loop formed by doubling the fastening tab over on itself, and

(B) a filamentary fastening element extending through the apertures of each of said fastening tabs, the ends of the filamentary element being joined together in a closed loop;

whereby said pair of shoes is attached together by said fastening element passing through the aperture in each of said tabs so that on removal of said fastening element, said shoes separate and said tabs are not visible outside said shoe uppers.

4,624,061

RUNNING SHOES

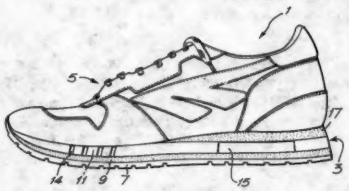
Frank V. Wezel, and Terry Mackness, both of Shoeburyness, England, assignors to Hi-Tec Sports Limited, Shoeburyness, England

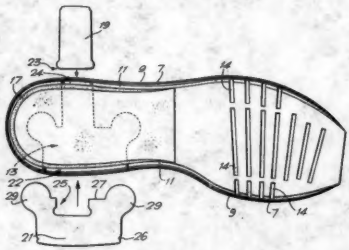
Filed Apr. 4, 1985, Ser. No. 719,844

Claims priority, application United Kingdom, Apr. 4, 1984, 8408700; Apr. 11, 1984, 8409358; Aug. 15, 1984, 8420758

Int. Cl.[4] A43B *13/12*

U.S. Cl. 36—30 A **16 Claims**





1. A running shoe having a sole structure which includes a heel portion formed of a shock-absorbing material and having a recess extending with an elongate slot-like cross-section fully across the width of said heel portion between a first, longer, elongate, slot-like opening on the inner side of the heel and a second, shorter, elongate, slot-like opening on the outer side of the heel, the directions of elongation of said openings and of the slot-like cross-section of the recess being generally parallel to the plane of the shoe sole and the recess being shaped in the plane generally including the directions of elongation of said first and second openings so as to be asymmetrical with respect to the general longitudinal heel-to-toe axis of the shoe, with a major portion of the recess being located at the inner side of the heel and a minor portion of the recess being located at the outer side of the heel, and said recess removably and interchangeably receiving therein an insert which at least substantially completely fills the recess, said insert being of selectable hardness characteristics for adapting the shoe to the individual requirements of the user and particularly for selectively providing anti-pronation and anti-supination properties.

4,624,062

SOLE WITH CUSHIONING AND BRAKING SPIROIDAL CONTACT SURFACES

James C. Autry, Dallas, Tex., assignor to Autry Industries, Inc., Dallas, Tex.

Filed Jun. 17, 1985, Ser. No. 745,709

Int. Cl.[4] A43B *13/00, 13/04*

U.S. Cl. 36—114 **17 Claims**

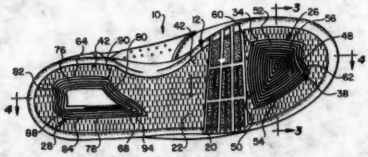
1. A sole for a shoe comprising:

a base member having a lower surface;

a contact surface attached to said base member and extending inwardly from said base member to below said lower

surface and disposed to contact the ground or floor before said lower surface makes contact as the shoe descends;

said contact surface including an eloneate, resiliently flexible spiroidal member vertically extending from said base member to below said lower surface, said spiroidal member having a plurality of involutions integral with one another;



at least one endless member disposed horizontally around said spiroidal member, said endless member being resiliently flexible and extending downwardly from said base member to below said lower surface;

said endless member adapted to make sealing contact with the ground or floor in order to entrap cudhioning air, said entrapped air further acting to cushion against impact between the wearer's foot and the ground or floor.

4,624,063

SKI BOOT WITH SERRATED CLAMPING STRAP

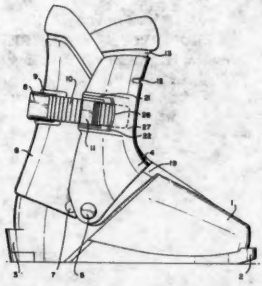
Marc Delery, Caluire, France, assignor to Compagnie Francaise d'Articles de Sport, France

Filed Nov. 13, 1984, Ser. No. 670,904

Claims priority, application France, Nov. 10, 1983, 83 18162

Int. Cl.[4] A43B *5/04, 11/00*

U.S. Cl. 36—117 **2 Claims**



1. A ski-boot comprising:

a shell adapted to receive a foot and a leg;

a spoiler mounted by hinges on said shell;

means for clamping said shell and said spoiler on said foot and said leg, said clamping means including a buckle system comprising a lever secured to said spoiler, a serrated strap connected to said lever, and a catch designed to cooperate with said strap secured on a part of said spoiler;

a chamber housing said catch, said chamber being defined by two parallel side walls molded on said spoiler, the height of said chamber coinciding with the height of said catch; and

said chamber being extended by a streamlined structure gradually conforming to the remainder of said spoiler towards its front, and including an opening perpendicular to said two side walls plumb with an edge of said streamlined structure, said opening being adapted to accomodate a free end of said serrated strap under said streamlined structure.

4,624,064

SKI BOOT, IN PARTICULAR REAR ENTRY SKI BOOT WITH FOOT INSTEP SECURING DEVICE

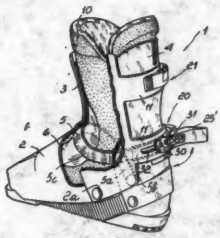
Adolfo Pozzebon, Sala d'Istrana, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Division of Ser. No. 580,420, Feb. 15, 1984, abandoned. This application Mar. 10, 1986, Ser. No. 837,896

Claims priority, application Italy, Feb. 24, 1983, 19745 A/83

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—119 **1 Claim**



1. A rear entrance ski boot having a longitudinal extension and an upwards extension transverse to said longitudinal extension, said ski boot including a shell portion defining a foot instep region, hinge means on said shell portion, a swingable front leg portion hinged on said shell portion through said hinge means thereof and a swingable rear leg portion hinged on said shell portion, said swingable front leg portion having rearwardly extending tab formations encircling said rear leg portion and closure means on said tab formations, said tab formations and said closure means being arranged upwardly at a distance from said hinge means, a pressure element in said instep region within said shell portion, a strap member extending over said pressure element and having one end thereof fixed on said shell portion and an opposite shiftable end connected to said closure means, said strap having a section thereof extending from said pressure element up to said opposite shiftable end thereof, said strap section extending at a distance above said hinge means, said opposite shiftable end of said strap being rigid with said swingable front leg protion when said closure means are in closed condition thereby to follow the swinging movement of said swingable front leg portion and to move forward when a forward lean of said swingable front leg portion occurs thereby to slacken said strap with respect to said pressure element.

4,624,065

ALPINE SKI BOOT

Michel Maboux, Seynod, and Jean Paris, St-Jorioz, both of France, assignors to Salomon, S.A., Annecy, France

Filed Jun. 18, 1982, Ser. No. 389,763

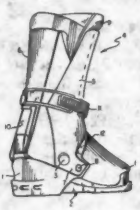
Claims priority, application France, Jun. 24, 1981, 81 12907

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—120 **40 Claims**

1. A ski boot for use in Alpine skiing, said boot comprising a shell base and an upper, said upper being adapted to pivot around a horizontal transverse journal axis, said upper comprising a cuff and a rear spoiler, said upper further comprising at least one extension extending from said journal axis, said at least one extension being adapted to cooperate at its end spaced from said upper with a support point on said shell base, wherein said at least one extension comprises a flexion blade

extending between said journal axis and said support point which resists pivoting of said upper relative to said shell base,



wherein said end of said extension is fixedly attached to said shell base at said support point.

4,624,066

DREDGE WITH TWIN CUTTER HEAD AND SUSPENSION THEREFOR

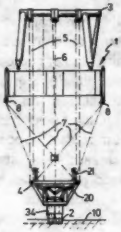
Cornelis Heuvelman, Den Haag, Netherlands, assignor to Zanen Verstoep N.V., Leidschendam, Netherlands

Filed May 6, 1985, Ser. No. 730,895

Claims priority, application Netherlands, Dec. 14, 1984, 8403797

Int. Cl.[4] E02F *3/92*

U.S. Cl. 37—65 10 Claims



1. A dredge for deep water operation from a vessel, comprising:

a hoisting stand mounted on the vessel;

a support frame formed as an open work cradle, depending from the hoisting stand;

a cutter mounted in the support frame;

hanger tackle means coupled between opposite lateral sides of the cradle and the hoisting stand for controlling the cradle in the vertical direction;

tip tackle means coupled between fore and aft sides of the cradle and the hoisting stand for controlling the fore and aft tipping movement of the cradle; and

stay tackle means for coupling the support frame and the vessel;

said stay tackle means extending between port and starboard of the vessel in a cross-wise manner to the opposite lateral sides of the support frame for maintaining the position of the cutter as it is moved through the soil;

said cutter being a twin cutter in parallel spaced relationship to each other for simultaneous attack on the ground, rotatable in opposite directions for providing a reaction free action.

4,624,067

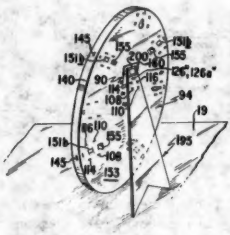
FRAME ASSEMBLIES

John F. Kristofich, 25 Jacob Rd., Washington Township, Washington County, N.J.

Continuation-in-part of Ser. No. 440,004, Nov. 8, 1982. This application Dec. 7, 1983, Ser. No. 558,790

Int. Cl.[4] A47G *1/06;* G09F *1/12*

U.S. Cl. 40—152.1 6 Claims



1. For use in connecting a frame to an article such as a second frame or support member, wherein said frame and article each include at least two apertures spaced apart a predetermined distance, a hinge comprising:

a first member adapted to be connected to said frame,

a second member adapted to be connected to said article, and

means pivotaly connecting said first and second members together,

said first and second members each including (a) at least a pair of legs terminating in projections adapted to be received within respective pairs of said apertures and (b) means for locking said projections within their associated apertures.

4,624,068

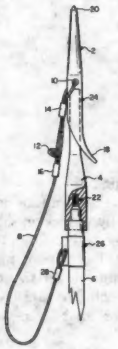
SPEARPOINT ASSEMBLY

Harland V. Howard, III, Largo, Fla., assignor to Panama Breakaway, Inc., Bethel Park, Pa.

Filed Dec. 4, 1985, Ser. No. 804,568

Int. Cl.[4] A01K *81/04*

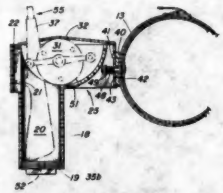
U.S. Cl. 43—6 8 Claims



1. In a spearpoint of the type tethered to a spearshaft by a cable and having a pointed distal end and a proximate end that releasably engages with an adaptor connected to the distal end of a spearshaft, the improvement which comprises a selective cable connector means to allow the spearpoint distal end to be rotated about an aperture of the spearpoint through which the cable is connected to said spearpoint, and means to maintain

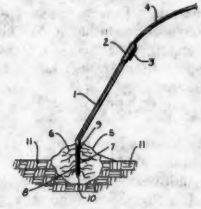
the rotated spearpoint adjacent to said cable, whereby retrieval of the spearpoint through a wound in a speared prey is facilitated.

4,624,069
ROD HOLDER APPARATUS
John D. Schneider, 1413 Eton, Perryton, Tex. 79070
Filed Jul. 5, 1985, Ser. No. 751,940
Int. Cl.[4] A01K *97/08, 97/10*
U.S. Cl. 43—21.2 **7 Claims**



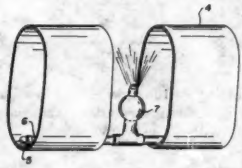
1. Apparatus for releasably securing a fishing rod having a handle and reel attached thereto, to an inflated, floatable, toroidally shaped apparatus comprising:
   a. an attachment housing portion formed of a tubular portion having a "C" shaped cross-section and having an outer and inner surface;
   b. attachment means mounted on the outer surface of said attachment housing portion;
   c. tubular support means for receiving said handle longitudinally therein;
   d. extension coupling receptacle means positioned between and connecting said tubular support means to said attachment means and formed to cooperate with said tubular support means, to receive said reel therein and,
   e. strap means attached to said attachment housing portion so that when said inner surface of said attachment housing portion is oriented to mate with the outer surface of said toroidally shaped apparatus, said strap means can extend around and thereby secure said attachment housing portion to said toroidally shaped apparatus.

4,624,070
METHOD AND COMPOSITION FOR PEST CONTROL USING ANESTHETIC AND INSECTICIDE
Grady W. Query, P.O. Box 34473, Charlotte, N.C. 28234; O. Grady Query, P.O. Box 1407, Charleston, S.C. 29402, and H. Fred Kessler, 1722 E. 8th St., Charlotte, N.C. 28204
Continuation-in-part of Ser. No. 451,810, Feb. 1, 1983, Pat. No. 4,534,128. This application May 28, 1985, Ser. No. 738,410
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] A01M *7/00*
U.S. Cl. 43—132.1 **22 Claims**



1. A method of treating insects or pests, comprising:
   a. combining a mixture of approximately 0.5% to 2.5% insectide with the balance of the mixture being approximately two-thirds dimethyl ether as an anesthetic and one-third inert ingredients; and
   b. applying said mixture onto a nest or dwelling place of said insects or pests or onto the insects or pests themselves whereby said anesthetic reduces the mobility of said insects or pests while said insecticide acts to kill said insects or pests.

4,624,071
HERBICIDE APPLICATOR
Glen A. Mumey, R. R. #3, Wetaskiwin, Alberta, Canada T9A 1X1
Filed Jun. 24, 1985, Ser. No. 747,865
Int. Cl.[4] A01G *13/00*
U.S. Cl. 47—1.5 **4 Claims**

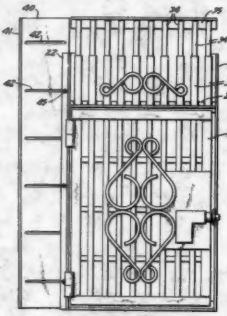


1. A herbicide applicator for applying liquid herbicide to weeds, comprising:
   an elongate frame member supportable for movement in spaced parallel relationship to the ground surface;
   an elongate loop of solid, flexible, absorbent material, mounted to depend freely from the frame member whereby it may brush against the weeds as the frame member moves along, said loop having sufficient stiffness and depending from the frame so as to provide a bottommost portion which is substantially semi-circular in configuration, to provide a broad arc of material adapted to hold a reservoir of herbicide for application, said loop forming a cavity adapted to accommodate an internal spray assembly;
   elongated means, deployed within the loop along its length and being supported by said bottommost portion of said loop said loop, for spraying, under pressure, herbicide into the loop cavity to wet the absorbent material; and
   means for supplying the herbicide to the spraying means under pressure at a controlled rate selected to maintain the absorbent material of the bottommost portion of the loop at a predetermined moisture content.

4,624,072
ADJUSTABLE SECURITY WINDOW GATE
Uri Zilkha, 330 Third Ave., New York, N.Y. 10016
Filed Apr. 12, 1985, Ser. No. 722,514
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—55 **1 Claim**

1. In an approved adjustable window security gate of a type including a relatively fixed frame and a gate element hingedly mounted thereon, the improvement comprising: said fixed frame element having first and second adjustable elements selecively movable in the plane of said frame element in first and second mutually perpendicular directions to contact a pair of corresponding mutually angularly disposed surfaces of a window opening, whereby said gate may be selectively installed in rectangular window openings over a range of dimensions; said fixed frame element including four mutually perpendicular frame members, one of said adjustable elements comprising a first plurality of hollow tubes, each having a first end secured to one of said frame members, a fifth frame member generally parallel to said last-mentioned one of said frame members, a second plurality of tubes, each having first ends secured to said fifth frame member, and extending laterally

therefrom, each of said second plurality of tubes being slidably disposed in telescoping manner within a corresponding one of



said first plurality of tubes, whereby to adjustably determine the effective dimension of said fixed frame element upon installation thereof within a window opening.

4,624,073

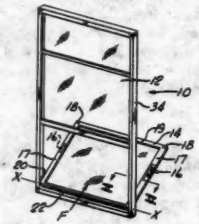
LOCKING TILT WINDOW SASH AND LOCK THEREFOR

Robert P. Randall, Pittsburgh, Pa., assignor to Traco, Warrendale, Pa.

Filed Nov. 15, 1985, Ser. No. 798,384

Int. Cl.[4] E05D *15/22*

U.S. Cl. 49—161 **17 Claims**



1. In a window unit having at least one tilt window sash which is vertically slidable with respect to the window jamb to open and closed positions, said sash comprisng:

a frame including a pair of laterally spaced, vertically coextensive stiles;

pivot means adjacent the bottom of each respective stile to support said sash for vertical sliding and for tilting with respect to said jamb;

latch means adjacent the top of each respective stile to support said sash for vertical sliding with respect to said jamb, said latch means being selectively releasable to permit tilting of said sash about said pivot means;

lock means carried by the respective said stiles longitudinally intermediate the respective said pivot means and said latch means;

said lock means being engageable in interlocking engagement with the window jamb when said sash is closed to support said stiles with respect to said jamb under force components directed generally perpendicularly to said sash; and

said lock means being operable in response to initial movement of said sash to disengage from said jamb and permit tilting of said sash, and to re-engage said jamb in locking engagement therewith in response to return of said sash to its closed position.

4,624,074

SLIDING DOOR ASSEMBLY

Kevin P. Shuttleworth, Stoke-on-Trent, England, assignor to Don Bur (Bodies & Trailers) Limited, Staffordshire, England

Filed Dec. 14, 1984, Ser. No. 681,863

Claims priority, application United Kingdom, Dec. 16, 1983, 8333575

Int. Cl.[4] E05D *15/10*

U.S. Cl. 49—222 **30 Claims**

1. A sliding door assembly having at least one slidable door having means to be swung out of a first, closed position into a second position, said at least one slidable door being swingable out of a first, general plane occupied in said closed position to occupy whilst in said second position a second, general plane substantially parallel to said first, general plane; said slidable door having means to be slid past a wall or other door of said assembly which is aligned with said first, general plane and in which said at least one swingable door carries slider means, for example rollers, and said slider means is cooperable with a slide rail to allow said door to be slid along said slide rail in use, said slider means being arranged to pivot about said slide rail relative to said door when said door is swung from said first position relative to said second position; the slide rail defining a groove along which the slider means is entrained to move, said groove being appropriately dimensioned to allow the slider means to pivot whilst still in the groove, the inner edge of the groove being curved, the curved inner edge of the groove being defined by the curved edge of a projection of convex section.

4,624,075

FITTING FOR A TWO-WAY OPENING WINDOW WITH MEANS FOR LOCKING THE WINDOW IN ONE DIRECTION

Daniel Vigreux, Hartzviller, France, assignor to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France

Filed Jan. 10, 1985, Ser. No. 690,465

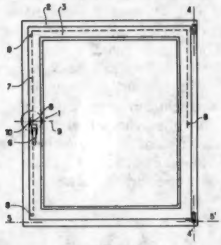
Claims priority, application France, Jan. 25, 1984, 84 01238; Jan. 31, 1984, 84 01586

Int. Cl.[4] E05D *15/52*

U.S. Cl. 49—192 **24 Claims**

1. Window or French-window fitting operable by means of a single handle permitting of setting the fitting in a locked position and two window opening positions, said fitting, disposed between the fixed frame and the movable frame of the window, comprising at least one locking member rigid with a control rod disposed on one of said frames and adapted to be moved by means of said single handle through a distance corresponding to two successive pitches, and at least one

keeper adapted to be engaged by said locking member and disposed on the other frame, this fitting comprising on the one hand at least one locking means, consisting of said locking member and said keeper, one of which being adapted to be



moved through the distance of one pitch by actuating said control rod in the normal direction of travel of said control rod and on the other hand a safety device adapted to lock said locking member at the end of its linear translation.

4,624,076

DOOR OPENER

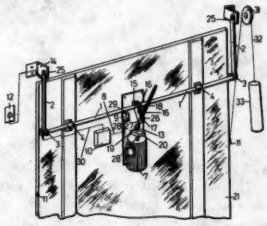
Johannes F. Schoeman, P.O. Box 4322, Bloemfontein, South Africa

Filed Jun. 14, 1985, Ser. No. 744,577

Claims priority, application South Africa, Jun. 18, 1984, 84/4577; Jul. 23, 1984, 84/5662; May 28, 1985, 85/4023

Int. Cl.[4] E05F *11/00*

U.S. Cl. 49—199 **13 Claims**



1. A door opener which comprises two levers hingedly mountable on a door, distal ends of the levers adapted for connection to a door support structure, proximal end(s) of the lever(s) fixed to a shaft which is rotationally mountable on the door, torque applying structure functionally connected with the shaft and an actuator, which structure and actuator are mountable on the door.

4,624,077

WINDOW INSULATION

Pentti Ahonen, 55 Franklin St., Milton, Mass. 02186

Continuation of Ser. No. 369,144, Apr. 16, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 602,182

Int. Cl.[4] E06B *1/04*

U.S. Cl. 49—432 **6 Claims**

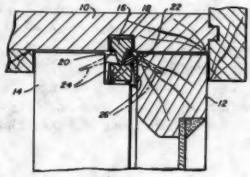
1. In a window having a window casement or frame and a pair of window panels each of which includes a window panel frame and glazing, the improvement comprising a bead extending vertically in a groove in the window frame and adapted to partially limit the position of the window panel means as the window panel means slides in the window frame, said bead having a base section disposed in the groove in the window frame and a gasket supporting section which projects inwardly from the window frame, said gasket supporting section only having a pair of longitudinally extending, oppositely disposed grooves on opposite sides thereof for receiving respective resilient deflectable gaskets that extend toward said respective window panel frames, each gasket assuming a folded position deflectable against the window panel frame to provide an air tight seal between the window panel frame and bead,

wherein each gasket has a length on the order of about one half the length of the bead,

wherein one gasket is disposed on the lower end of the bead and the other gasket is disposed on the upper end of the head with slight overlap between gaskets,

said bead grooves each having a dovetail interlocking recess and said gasket having a base adapted to interlock with said recess and a tapered free end thinner than and extending from said base, said free end having a non-deflected position extending toward the panel but disposed at an angle less than a 90° angle to the bead side and further having a deflectable position for providing said air tight seal,

said bead grooves being disposed in angular relationship so that the respective gaskets extend in opposite directions but have an angle therebetween in their non-deflected position less than a 180° angle,



said bead opposite sides disposed to provide a gap between each side and the window panel frame to enable accommodation of the tapered free ends of the gasket in said gap and extending substantially, in the deflectable position thereof, parallel to the bead sides,

one of said window panels having a side-disposed longitudinal vertical recess adjacent the other window panel and adapted to receive said bead,

said recess enabling the window panels to be in close side-by-side relationship with one gasket disposed to contact a wall defining the recess and the other gasket disposed to contact the other window panel,

said bead having a third groove on a face thereof, and a third gasket received by said third groove,

wherein the face carrying the third groove extends substantially normal to the bead surfaces in which the pair of grooves are disposed,

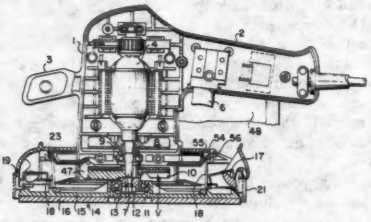
wherein said third gasket is supported in a groove with a dove-tail interlock with the third gasket having an outer substantially flat surface,

said third gasket being separately and independently supported from said one and another gaskets with the third gasket spaced independently from said one and another gaskets and adapted to contact another wall defining the recess.

4,624,078
SURFACE SANDER

J. G. Van Rijen, Prinsenbeek, and Jan P. Houben, Breda, both of Netherlands, assignors to Skil Corporation, Breda, Netherlands

Filed Oct. 12, 1984, Ser. No. 660,281
Claims priority, application Netherlands, Oct. 17, 1983, 8303577
Int. Cl.[4] B24B *23/00*
U.S. Cl. 51—170 MT 15 Claims

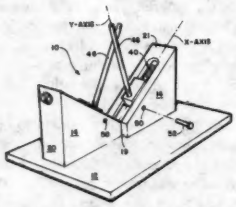


1. A surface sander comprising:
a housing having a handle;
a motor having a shaft extending therefrom and arranged in said housing;
a sanding foot having a bearing for receiving an end of said shaft so that said end of said shaft is eccentrically arranged in said bearing;
a dust collector hood comprising at least two mutually interlocking parts connected at a lower end of said housing and surrounding said sanding foot; and
flexible means, contained in said dust collector hood, for connecting said sanding foot to said housing, said flexible means including an upper annular rim clamped between a rim formed on said lower end of said housing and said dust collector hood.

4,624,079
KNIFE SHARPENER

Mario J. Bonapace, 7396 Broadway, Lemon Grove, Calif. 92045

Filed Apr. 29, 1985, Ser. No. 728,339
Int. Cl.[4] B24B *9/04, 7/02*
U.S. Cl. 51—214 6 Claims

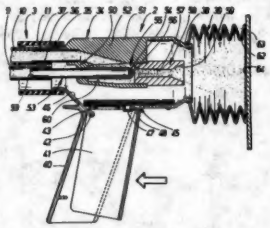


1. A knife sharpener comprising:
a base;
a pair of block members each having substantially the same predetermined external configuration, each of said block members having a bottom wall, laterally spaced side walls, a front wall, a rear wall, and a top wall that slopes downwardly from rear to front at a predetermined angle;
each of said block members having a channel that extends for a predetermined distance, the mouth of said channel being in said front wall, said channel having an axis parallel to the top surface of the top wall, a slot is formed in the top surface of said top wall that communicates with said channel;
said block members being fixedly attached to the top surface of said base, the mouths of said channels facing each other and being aligned on parallel offset axes;
a carriage slideably mounted in each of said channels, each said carriage having a neck portion that extends upwardly through said slot in a respective block member, rod members formed of abrasive material having said rod members bottom end attached to said neck portion and said rod members extend upwardly at the predetermined angle with respect to said top wall; and
a pair of spring members each of which is mounted in respective channels of said block members with one of said spring members ends attached to said carriage and said spring members opposite end attached to said block member.

4,624,080
ARRANGEMENT FOR USE WITH BLASTING EQUIPMENT

Klas Jakobsson, Trollhättan, Sweden, assignor to Bilskade-Service HB, Trollhättan, Sweden

PCT No. PCT/SE83/00002, § 371 Date Sep. 12, 1984, § 102(e) Date Sep. 12, 1984, PCT Pub. No. WO84/02673, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 13, 1983, Ser. No. 653,249
Int. Cl.[4] B24C *3/06, 5/02, 7/00*
U.S. Cl. 51—410 1 Claim



1. A blasting apparatus comprising: a blasting pistol, said pistol having a first hose nipple, a second hose nipple, and a third hose nipple, a nozzle connected to said first hose nipple, a housing surrounding said nozzle and connected to said second hose nipple, said housing having an outlet for blasting material; a screening device enclosing said housing and having a first opening for placement against a work piece, a suction channel extending from inside said screening device and ending in said third hose nipple, said screening device having a second opening, a valve in said second opening, and a trigger for actuating said valve; a stationary unit comprising: first nipple means, second nipple means, and third nipple means; a control valve having an inlet for compressed air from a supply source, an outlet for compressed air terminating in said first nipple means, a valve body between said inlet and outlet for interrupting the connection between the inlet and outlet in a first position and in a second position holding the connection open, said valve body having an actuating portion having a first side facing a chamber and a second side under the pressure of the surrounding air, a spring biasing said valve body into said first position when the pressure in the chamber is substantially the same as the pressure of the surrounding air, while allowing the valve body to be in said second position when the pressure in the chamber is at a predetermined value lower than the pressure of the surrounding air, said second nipple means being connected to the chamber, a container with a space for blasting material, an electric suction unit with an inlet connected to said second nipple means and an outlet connected to said space, in said space a suction head with an inlet in contact

with the blasting material and connected to said third nipple means; hose means between said pistol and said stationary unit and including three conduits: a first conduit for compressed air and connecting said first hose nipple of said pistol with said first nipple means of the stationary unit; a second conduit forming a suction channel and connecting said third hose nipple with said second nipple means; and a third conduit for blasting material and connecting said second hose nipple with said third nipple means; whereby, when both the first opening of the screening device is closed by being pressed against the workpiece and the second opening is closed by closing said valve with said trigger, the predetermined lower pressure is reached in the chamber, the valve body will open the supply of air to the nozzle so that the nozzle operates as an ejector pump, thereby sucking blasting material through said suction head from said space to form a jet against a workpiece situated in the first opening of the screening device.

4,624,081

TURN-AROUND MECHANISM FOR WORKPIECES IN GRINDING MACHINES

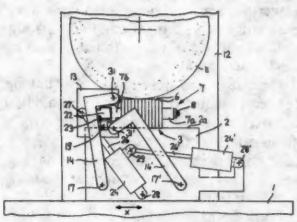
Reinhard Janutta, Geesthacht, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,753

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403888

Int. Cl.[4] B24B *3/52*

U.S. Cl. 51—98.5 **16 Claims**



1. A machine for removing material from consecutive workpieces of the type having pairs of surfaces to be treated and wherein such surfaces are disposed opposite each other, especially for grinding consecutive stacks of twin-bladed knives for use in hedge trimming apparatus and the like, comprising a rotary material removing tool; a support having a work supporting face; and a mechanism for inverting consecutive workpieces with reference to said support so that the treatment of one surface of the workpiece resting on said support can be followed by the treatment of the other surface of such workpiece, comprising a turn-around device including at least one inverting member having means for engaging consecutive workpieces outside of said surfaces of the engaged workpiece and to hold the engaged workpiece in cantilever fashion, and drive means for moving said inverting member and the workpiece which is held by the inverting member between a first position in which one surface of the engaged workpiece is in a position to be treated by said tool and a second position in which the other surface of the engaged workpiece is in a position to be treated by said tool, said drive means defining for the movement of said inverting member a path wherein said inverting member is remote from said work supporting face and is caused to turn about a predetermined axis which is at least substantially parallel to said face, said drive means comprising a pair of arms, first pivot means articulately connecting said arms to said inverting member for angular movement about discrete first and second axes, second pivot means articulately connecting said arms to said support for angular movement about discrete third and fourth axes which are parallel to said first and second axes, and means for pivoting said arms about the respective axes.

4,624,082

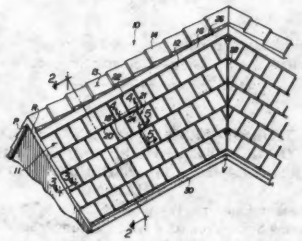
GRID SYSTEM AND METHOD FOR CAST FORMING MONOLITHIC CONCRETE ROOF COVERING

Peter W. Mansfield, 511 59th St., Holmes Beach, Fla. 33510

Filed Jun. 27, 1985, Ser. No. 749,391

Int. Cl.[4] E04B *7/02*; E04D *13/04*

U.S. Cl. 52—11 **8 Claims**



1. A monolithic roof covering for installation atop the subsurface a sloped roof, said roof covering comprising:

a plurality of generally horizontally disposed adjacent, parallel, simulated rows of panel portions, said simulated rows collectively covering the entire roof subsurface from peak to eave;

said roof covering monolithic from peak to eave;

each said simulated row generally horizontally disposed and defined by adjacent, parallel row edges generally vertically disposed and spaced above the roof subsurface;

each said simulated row having a top surface formed by the top surfaces of said panel portions;

each panel portion defined by a recess line disposed generally in alignment with the slope of the roof subsurface, each said recess line penetrating partially into said simulated row top surface but not to the roof subsurface;

the lower horizontal edge of each said simulated row defining the upper horizontal edge of each downwardly adjacent said simulated row such that said roof covering has a stepped simulated row configuration as it progresses down the slope of the roof subsurface;

said roof covering cast formed in place atop the roof subsurface of curable and hardenable cementitious material in its precured state.

4,624,083

SCREEN SYSTEM FOR OFFICES AND METHOD OF MAKING AND INSTALLING SAME

Niels Diffrient, Ridgefield, Conn., assignor to Hauserman, Inc., Cleveland, Ohio

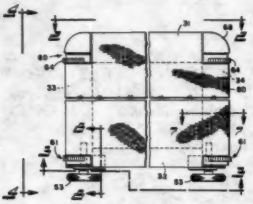
Filed Dec. 5, 1983, Ser. No. 558,202

Int. Cl.[4] E04B *2/82*; E05D *1/04*

U.S. Cl. 52—65 **12 Claims**

1. An interior office sound and visual screen having a central septum including top and bottom frame members, semi-circular extrusions secured at the top and vertical edges of said septum, said semi-circular extrusions being wider than the septum, semi-circular gears at the top and bottom of the vertical edge semi-circular extrusions, means to secure said gears to the septum, and half-dome covers for the gears at the top of the

vertical edge semi-circular extrusions, said half-dome covers filling the upper corners of the screen between the vertical



extrusions and forming a generally rounded corner surface continuation of the semi-circular extrusions.

4,624,084

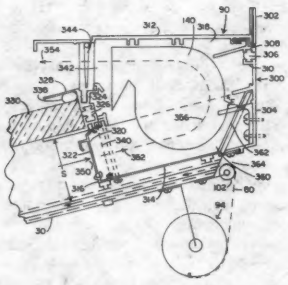
STRUCTURAL ELEMENT ESPECIALLY SUITABLE FOR SOLAR GREENHOUSES AND THE LIKE AND PARTICULARLY UTILIZABLE FOR CONTROLLED SHADING

Christopher Esposito, West Bay Shore, N.Y., assignor to Four Seasons Solar Product Corp., Farmingdale, N.Y.

Division of Ser. No. 455,475, Jan. 4, 1983. This application Mar. 5, 1985, Ser. No. 708,507

Int. Cl.[4] E04H *14/00*

U.S. Cl. 52—173 R **5 Claims**



1. A solar greenhouse construction comprising glazing, support means to support said glazing in a combination to define an at least partly enclosed space, said glazing being permeable to solar radiation to allow said radiation to pass into said space, shade means in said space and adapted for being positioned adjacent at least part of said glazing to intercept at least part of the radiation passing through said glazing, said support means being provided with track channels in which the shade means is engaged and by which the shade means is guided along said glazing, a rigid structure for engaging the support means at the upper end of the latter, said rigid structure having a vent, a blower means in said rigid structure and adapted for displacing air from between said shade means and glazing and expelling said air outwardly through said vent, said support means including at least two parallel glazing bars each provided with one said track channel, the track channels being in facing relation, said shade means including a shade having lateral edges accommodated in respective of said channels said glazing bars each including ends resting against the rigid structure, but angularly related thereto to define a space therewith, said construction further comprising a guide roll at least partly in said space to guide said shade such that said lateral edges are received in and guided by said channels, and a source roller upon which said shade is at least partly rolled and from the shade passed around the guide roll to the glazing bars.

4,624,085

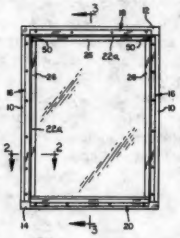
WINDOW STOP

James P. Thosath, 1919 E. 34th, Spokane, Wash. 99203

Filed May 30, 1985, Ser. No. 739,160

Int. Cl.[4] E06B *1/04*

U.S. Cl. 52—204 **3 Claims**



1. A window stop for fixed windows of the type having a roughed-in frame with side, top, bottom and front surfaces, said stop comprising

a pair of jamb legs having front and rear edges and arranged to fit against the side surfaces of a roughed-in frame,

a head piece having front and rear edges and arranged to fit against the top surface of the roughed-in frame,

each of said jamb legs and head piece comprising a flat body member arranged to lie against the respective surfaces,

each of said jamb legs and head piece also having a first flange leading outwardly from said body member at a right angle at a point rearwardly of said front edge and arranged to abut against the front surface of the roughed-in frame for securement to the frame by fasteners,

each of said jamb legs and head piece also having a second right angle flange leading outwardly from said body member at a point forwardly of said rear edge and in a direction opposite from said first flange,

and a sil! piece comprising a body member having front and rear portions and arranged to seat against the bottom surface of the roughed-in frame,

said sill piece body member having a first flange leading downwardly therefrom at a right angle and at a point rearwardly of its front portion and arranged to abut against the front surface of the roughed-in frame,

said sill piece body member having a first vertical wall at its front portion and a second vertical wall forward of its rear portion,

said sill piece body member also having a top wall angled downwardly between said first and second vertical walls,

said rear portion of said sill piece body member comprising a horizontal flange,

said first flange and horizontal flange at said rear portion being arranged to be secured to the roughed-in frame by fasteners,

the portion of said jamb legs, head piece, and sill piece which is forward of their respective first flanges being arranged to provide abutment for siding or molding to be installed around the stop,

the rear of said second flanges of the jamb legs and the head piece and said vertical rear wall of said sill piece being in substantial lateral alignment and being arranged to comprise an abutting securing surface for a pane of glass.

4,624,086

ADJUSTABLE SELF-LEVELING SLEEVE INSERT FOR CONCRETE PASSAGES

Robert K. MacKay, 44 Irving Dr., South Walpole, Mass. 02071

Filed Dec. 5, 1984, Ser. No. 678,254

Int. Cl.[4] E04B *5/48*

U.S. Cl. 52—220 **20 Claims**

1. A pipe sleeve device for forming a passage through a concrete structure used in conjunction with a vertical form

wall, which device is rigidly self-aligned and totally secured by attaching the device to a single vertical form wall and the device comprises:

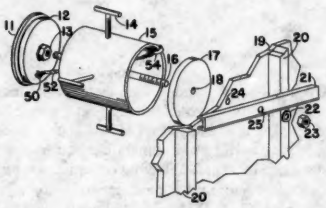
a first form wall provided with an interior surface which contacts the concrete, an exterior surface having spaced wall ribs and a hole through the wall between two adjacent wall ribs connecting the two surfaces;

a rigid hollow pipe sleeve around which concrete may be poured and which thereby forms a passage in the concrete, which pipe sleeve is provided with an opening at each end and an internal sleeve diameter which serves as the boundaries of a clear passage through the hollow pipe sleeve, and which pipe sleeve is located interiorly of the form wall;

a first solid disc bordering a first pipe sleeve opening and removably secured thereto and which first solid disc has a perimeter;

a safety retaining means retaining the first solid disc to the sleeve to prevent the first solid disc from falling;

a second end disc covering a second sleeve opening, which second end disc is provided with a small central opening



therethrough and which second end disc fits tightly and removably within the second sleeve opening, wherein the second end disc opening is aligned with the wall hole to assure alignment of the device;

a removable rigid rod elongated member centrally located within the sleeve, secured to the interior of the first solid disc and extending out through the opening in the second end disc, wherein the extended end of the rod passes through the opening in the form wall;

a rigid cross-member secured to the end of the rod exteriorly of the form wall spanning a substantial portion of the wall;

a rod fastener means to create a compressive force between the cross-member and the sleeve to pull the first solid disc toward the second end disc and the sleeve against the first form wall to sandwich the wall securely therebetween, so that the device is sufficiently secured to the first form wall to resist the weight of the concrete;

a second vertical form wall which merely abuts the first sleeve and which second form wall is secured to the first form wall by means independent of the device for receiving poured concrete between the form walls.

4,624,087

DRYWALL EXTERIOR CORNER BEAD

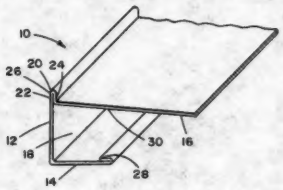
Joseph W. Schneller, Williamsville, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Nov. 28, 1984, Ser. No. 675,624

Int. Cl.[4] E04B *1/00*

U.S. Cl. 52—254 **10 Claims**

6. A drywall exterior corner structure comprising an elongate framing member having a rectangular cross section, a first wallboard affixed to one face of said framing member and a second wallboard affixed to a perpendicular face of said framing member, said second wallboard having mounted thereon a formed sheet metal corner bead comprising an elongate flat end web, an elongate short flange extending at substantially a right angle from one edge of said end web, and an elongate flat long flange extending at an angle of about 85° from the main portion of said end web and approximately 5° from parallel to said short flange and forming a channel therebetween, said flat long flange and said flat end web being adjoined by a narrow, double layer flange which includes an outer layer which is a narrow edge portion of said flat end web and a parallel inner layer which connects the outer edge of said end web with said long flange, said channel having a width sufficient for receiving an edge of a sheet of gypsum wallboard and said double



layer flange having a width sufficient for concealing the edge of an adjacent sheet of wallboard forming an exterior corner with said first sheet of wallboard, with said second wallboard having an edge extending into said corner bead channel, said corner bead long flange being disposed between said second wallboard and said framing member and said corner bead double layer flange being disposed over the edge of said first wallboard and concealing said first wallboard edge.

4,624,088

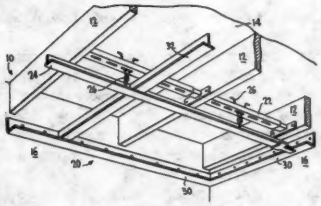
FLUSH MOUNTED SUSPENDED CEILING SYSTEM

Gordon R. Arent, 48 Brothers Rd., Wappingers Falls, N.Y. 12590

Filed Aug. 27, 1985, Ser. No. 769,688

Int. Cl.[4] E04B *5/52*

U.S. Cl. 52—484 **10 Claims**



1. A suspended ceiling support system for attachment to the lower surfaces of joists forming part of a ceiling and adapted to support a plurality of ceiling tiles, the system comprising a plurality of elongated support members extending between adjacent joists, said support members being located in at least one row, at least one main tee runner extending parallel to the row of support members, at least two wishbone-shaped springs attached to the main tee runner and which each extend through and engage an aperture in a support member such that the main tee runner can be selectively supported in at least two different vertical positions relative to the support member, and at least two cross-tee runners extending perpendicular to the main tee runner, one end of each cross tee runner being supported on the main tee runner whereby the cross-tee runners and main tee runners are capable of supporting at least one ceiling tile.

4,624,089

TIE ANCHOR FOR REINFORCED SANDWICH PANELS

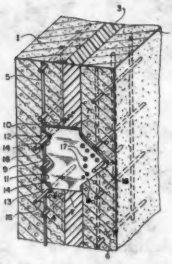
Friedrich W. Dunker, Altena, Fed. Rep. of Germany, assignor to Siegfried Fricker, Wiernsheim, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 631,087

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325352

Int. Cl.[4] E04C *5/18*

U.S. Cl. 52—410 10 Claims



1. A tie anchor for cast sandwich panels and the like, particularly sandwich panels of the type which comprise two spaced panels of steel-rod-reinforced cast concrete or comparable reinforced building wall material and an intermediate insulating layer or insulating air space, wherein one of the two panels is a carrier panel and the other one is a face panel and the tie anchor is designed to support the face panel on the carrier panel by having at least one end portion embedded in each panel, as the latter are cast in succession, the tie anchor comprising:

a substantially flat tie anchor body having a longitudinal axis;

at least one convergingly tapered end portion defined by each axial end of the tie anchor body, at least one of said axial ends defining two transversely spaced, convergingly tapered end portions; and

at least one positioning bore in each of said tapered end portions, for the insertion therethrough of a tie anchor positioning rod; and wherein

the tapered end portion, or end portions, respectively, on one of the two axial ends of the tie anchor body form a hook portion around a half-loop bend, at a bending line which extends transversely to the longitudinal axis of the tie anchor body;

each hook portion includes a bent hook portion extending at a distance from an unbent hook portion which is aligned with the tie anchor body, so that the hook portion, or portions, respectively, are engageable over a reinforcing rod in one of said two panels; and

each hook-portion-forming tapered end portion has at least one pair of aligned positioning bores in its bend and unbent hook portions, for the insertion of a positioning rod through said pair of aligned bores, which positioning rod locks the tie anchor to the reinforcing rod by engaging the side of the reinforcing rod opposite the side engaged by the hook portion, or hook portions, respectively, thereby positioning and orienting the tie anchor in relation to the reinforcing rod during casting of the first panel.

4,624,090

NODE ELEMENT AND FRAMEWORK BAR FOR TRIDIMENSIONAL FRAMEWORKS

Karl H. Stienen, Boll, Switzerland, assignor to Paul Trohler, Bolligan, Switzerland, a part interest

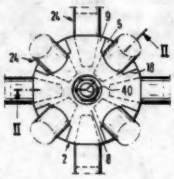
PCT No. PCT/CH84/00051, § 371 Date Dec. 18, 1984, § 102(e) Date Dec. 18, 1984, PCT Pub. No. WO84/04123, PCT Pub. Date Oct. 25, 1984

PCT Filed Mar. 23, 1984, Ser. No. 694,446

Claims priority, application Switzerland, Apr. 19, 1983, 2089/83

Int. Cl.[4] E04H *12/18*

U.S. Cl. 52—648 7 Claims



1. A framework bar and a node element for joining bars at the nodes of a tridimensional framework, wherein said a framework bar (24) has at each of its ends a plate-shaped extension (23) projecting in the longitudinal direction from the bar, each plate-shaped extension (23) having opposite side edges tapered towards its free end; said node element having a body including plural parts (1, 2; 31, 32, 33) which are stacked one on the other on a common axis (40), said plural parts each having a surface which faces the opposite surface of another (13/14, 15/16; 35/36, 37/38), the surface of each part which faces that of another including shallow indentations in registration with the shallow indentations in the opposite surface which between the opposite node element part surfaces define shallow cavities (20, 21) which are oriented towards a common point (6) in the center of said node element body on said common axis (40), said shallow cavities having side walls tapered towards the common point (6) and adapted to receive respectively one of said plate-shaped framework bar extensions (23), and means (3) for clamping said node element plural parts in the direction of said common axis (40) and thereby clamping said plate-shaped framework bar extensions (23) between said opposite node element part surfaces in said indentations forming said cavities (20, 21); said plate-shaped framework bar extensions (23) and said shallow indentations forming said cavities (20, 21) having configurations for shape-mating mounting said framework bar extensions (23) in said cavities (20, 21).

4,624,091

THERMALLY INSULATED WINDOW SASH CONSTRUCTION

Alexander J. Biro, Export, Pa., assignor to Winchester Industries, Inc., Saltsburg, Pa.

Filed Jul. 20, 1984, Ser. No. 632,910

Int. Cl.[4] E04C *2/38*

U.S. Cl. 52—656 27 Claims

1. A window sash member comprising a pair of rails members, composed of a resinous plastic material, fixedly secured to a pair of stile member, composed of a resinous plastic material, to define a unitary sash frame;

said rail members each having a first longitudinally extending hollow chamber;

reinforcing means composed of a material different from said rail members disposed with said first hollow chamber;

the joints between said rail members and said stile members being mitered welded joints;

said rail member except for the joint area having substan-

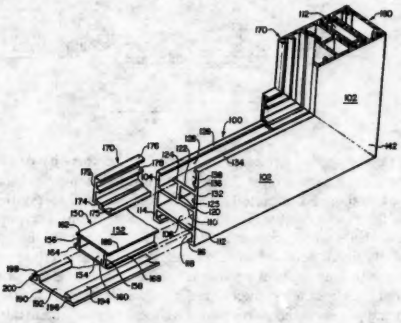
tially the same cross-sectional configuration throughout their longitudinal extent;

said rail members and said stile members each having a pair of generally parallel sidewalls, a first said sidewall being of greater height than a second said sidewall;

said rail members having a first transverse wall extending from said first sidewall to said second sidewall;

said rail members having a second transverse wall spaced from and oriented generally parallel with respect to said first transverse wall;

said first and second sidewalls and said first and second transverse walls cooperating to define said first hollow chamber;



a third transverse wall means being oriented generally parallel with respect to said and second transverse wall means;

said third transverse wall means extending from said first sidewall and terminating short of said second sidewall;

said second transverse wall being disposed closer to said third transverse wall than is said first transverse wall;

interior wall means oriented generally parallel to said first sidewall means connected said second and said third transverse wall; and

said interior wall means cooperating with said second and third transverse walls and said first sidewall to define a second hollow chamber.

4,624,092

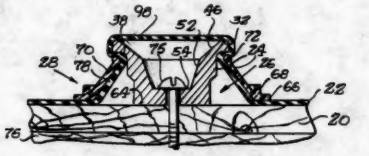
ROOFING MEMBRANE FASTENER

Albert R. Baginski, Torrance, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 22, 1984, Ser. No. 663,297

Int. Cl.[4] E04B *1/38*

U.S. Cl. 52—713 **12 Claims**



6. A two part fastener for a resilient membrane such as for roofing and comprising a post having upper lateral protuberance means at an upper end thereof, means at a lower end of said post for securing said post to a supporting surface such as a roof deck, said post having an upper surface with a recess therein, said recess tapering inwardly from said upper end thereof to said lower end thereof, a resilient membrane being drapeable over said post, and a retaining ring telescopible over said post and a membrane draped over said post, said ring having a rim adapted to rest on a membrane on said supporting surface, and a plurality of resilient fingers extending inwardly and upwardly from said rim, said fingers having upper ends adapted to pass over said lateral protuberance means and a membrane thereon and to engage beneath said protuberance means to grip a membrane.

4,624,093

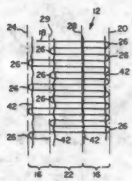
SINGLE-WIRE CARRIER EDGE PROTECTOR TRIM STRIP

Harold R. Gibson, Frederick, Okla., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Apr. 12, 1984, Ser. No. 599,492

Int. Cl.[4] E04F *19/02*

U.S. Cl. 52—716 **14 Claims**



1. A longitudinally extending wire carrier of a finite width defined by parallel spaced apart first and second edge lines for use in an edge protector trim strip comprising:

a continuous metallic serpentine wire having a plurality of looped portions along said first edge line, a plurality of looped portions along said second edge line, and a plurality of looped portions along a least one other line parallel to and interposed between and spaced apart from each of said first and second edge lines, said wire further having lengths of said wire extending transversely and spaced from one another longitudinally of said carrier for joining said looped portions together to form said serpentine wire having a longitudinally extending reinforced and unreinforced portions, said reinforced portion having a greater number of said lengths of wire per unit of length of said carrier than said unreinforced portion of said carrier; and

a plurality of strands of material extending longitudinally of said carrier and interwoven with said lengths of said wire to maintain the spaced relation of said wire lengths thereof.

4,624,094

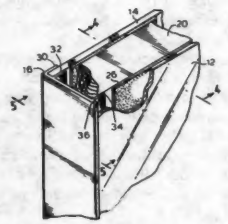
DOOR PANEL WITH A MIRROR SIDE

Benjamin W. Schwindt, 40 Axixa Ave., Bayshore, N.Y. 11706

Filed Sep. 21, 1984, Ser. No. 653,690

Int. Cl.[4] A47G *1/00*; E04C *2/38*

U.S. Cl. 52—786 **5 Claims**



1. A door panel assembly comprising:

a front side comprising a mirrored surface affixed to a first adhesive cushion means;

a rear side extending in parallel with said front side;

support means disposed between said front and rear sides; and

two parallel channels extending along corresponding edges of said sides and each comprising a web, a first flange, a second flange, a third flange, and a lip substantially coplanar with the web and extending past said third flange, said first and second flanges being spaced at a distance substantially equal to the thickness of the rear side and cooperating to hold said rear side, and said second and third flanges being spaced at a distance substantially equal to the thickness of said support means, and cooperating to hold said support means; said lip having a length which does not exceed the thickness of the front side; and

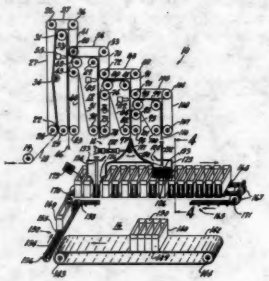
the first and a second adhesive cushion means adhesively affixed between said support means and said front and rear sides respectively, said first and second adhesive cushion means being substantially coplanar with, and of substantially equal thickness to the second and third flanges respectively.

4,624,095

FOLDING AND PACKAGING SYSTEM

Peter J. Gietman, Jr., Combined Locks, Wis., assignor to Custom Machinery Design, Inc., Appleton, Wis.

Filed May 22, 1985, Ser. No. 736,267
Int. Cl.[4] B65H *45/12*
U.S. Cl. 53—117 **32 Claims**



1. A system for folding individually and subsequently packaging plastic bags comprising:

a plurality of rollers mounted in a frame, each of said rollers having a plurality of spaced-apart annular grooves in its surface adapted to receive endless rope means, said rollers including discrete groups of rollers spaced apart from one another and connected by a plurality of said rope means to form a conveying surface for said bags, said rollers being further arranged so that each bag is maintained between the conveying surfaces of adjoining groups of said rollers in a conveying path while said bad is within said folding system;

said folding system including a first linear conveying path, a second linear conveying path which is arranged perpendicularly to said first linear conveying path, and a third linear conveying path perpendicular to said second path and parallel to but spaced apart from said first path;

a first anvil means at the intersection of said first and second paths for periodically urging each of said bags from said first path to said second path while said bag is moving in said first path;

said folding system having an outlet for unfolded bags at the end of said first path and an outlet for once folded bags at the end of said second path; and

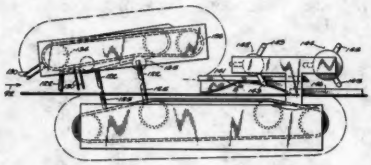
said folding system also comprising means for driving selected ones of said rollers.

4,624,096

HIGH SPEED WRAPPING MACHINE

John E. Nordstrom, Two Rivers, Wis., assignor to Barbara Nordstrom, Two Rivers, Wis., a part interest

Division of Ser. No. 507,938, Jun. 23, 1983, Pat. No. 4,426,825, and Ser. No. 187,115, Sep. 15, 1980, abandoned. This application Nov. 4, 1983, Ser. No. 548,875
Int. Cl.[4] B65B *11/06*
U.S. Cl. 53—209 **24 Claims**



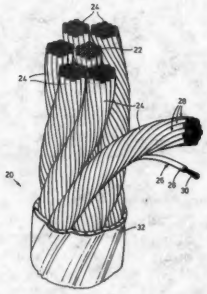
1. For wrapping products at high speed, a plurality of conveyor means to move products continuously along a substantially linear and horizontal product path, means to continuously feed individual wrapping sheets in a horizontal wrapper path with forward, rear and side edges to the top of the substantially linear product path in timed relationship to the product such that each sheet travels at the same speed as the product and overlies the product along its whole length with a front edge and a substantial portion of the sheet ahead of the product as the wrapper moves along its horizontal path and the rear edge of the wrapper being behind the product in the wrappers horizontal path, means to move the front edge of the sheet across the product path ahead of the product while the remaining portion of the wrapper remains in its horizontal path as the product continues to travel whereby the sheet is drawn across the front and bottom of the product by product travel creating a bottom trailing edge of the sheet, separate means for moving the top trailing edge of the sheet and the bottom trailing edge of the sheet against the rear edge of the product in overlapping relationship, sealing means to maintain said overlapping relationship, folding means to fold the sides of the sheet against the product and sealing means to seal said folds.

4,624,097

ROPE

Robert J. Wilcox, Ancaster, Canada, assignor to Greening Donald Co. Ltd., Hamilton, Canada

Filed Mar. 21, 1985, Ser. No. 714,323
Claims priority, application Canada, Mar. 23, 1984, 450373
Int. Cl.[4] D02G *3/36*; D07B *1/16, 7/14*
U.S. Cl. 57—232 **11 Claims**



1. A rope comprising:

a central strand;

a plurality of outer strands extending helically about the central strand; and

the central and outer strands each comprising a plurality of elements wrapped helically, each of the elements having a core of synthetic plastic filaments of denier no greater than 21000 and extending generally in parallel with one another, and a sheath about the core containing the filaments.

4,624,098

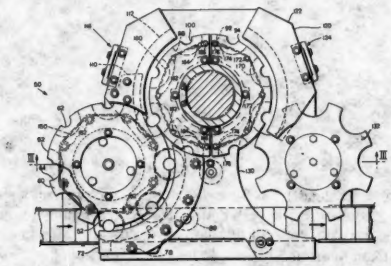
CONTAINER RESTRAINT SYSTEM

Alois F. Trendel, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 23, 1985, Ser. No. 790,571

Int. Cl.[4] B67B *3/20, 3/062;* B65B *7/28*

U.S. Cl. 53—314 **7 Claims**



1. A capping machine for applying threaded caps to threaded bottle necks, comprising:

a. a rotatable turret carrying a plurality of capping heads,

b. rotatable capping star wheel means having a plurality of pockets formed therein for receiving and moving containers having circular cross-sections around, beneath and in synchronism with said plurality of capping heads,

c. capper guide means spaced from said capping star wheel means for engaging circular cross-sections of and retaining containers in said capper pockets, and

d. means supported on said capping star wheel means for yieldingly urging containers in said capper pockets against said guide means, said urging means having a greater frictional engagement with a container than said guide means thereby restraining containers against rotation in said pockets during movement of said capping star wheel means.

4,624,099

PACKAGING APPARATUS FOR MAKING GAS-FILLED PACKAGES FROM PLASTIC FILM

John R. Harder, Cedar Grove, N.J., assignor to Mahaffy & Harder Engineering Co., Fairfield, N.J.

Filed Apr. 7, 1980, Ser. No. 137,628

Int. Cl.[4] B65B *31/02*

U.S. Cl. 53—432 **11 Claims**

1. Packaging apparatus wherein receptacles with upward-facing openings, and containing semi-liquid disarrangeable products, are moved along a line of advance passing through a series of packaging stations where packaging operations are performed, said apparatus comprising:

chamber means at one of said stations presenting a downwardly facing opening;

means to support said receptacle beneath said chamber opening;

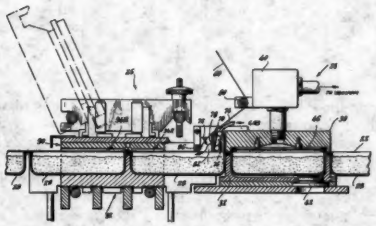
said chamber means including means sealingly engageable with said support means to carry out packaging operations while in sealed communication with the receptacle;

vacuum means connected to said chamber means to evacuate receptacles positioned therebeneath while sealingly engaged therewith;

gas supply means connected to said chamber means and operable while a receptacle is in evacuated condition and sealingly engaged with said chamber means to deliver gas to the receptacle;

control means including a screen supported beneath said chamber means for assuring that the air is evacuated from the receptacles substantially perpendicularly with respect to the upper surface of the product throughout substantially all of the areas thereof and to assure that the gas is delivered thereafter to the receptacle with the same perpendicular relationship;

top film lay-down means located downstream from said chamber means and arranged to apply a cover film over a gas-filled receptacle as it is moved out of said one station, said film being disposed along a path having a downward component of motion leading towards engagement with the receptacle;



second gas supply means located downstream from said chamber means and near said top film lay-down means, said second gas supply means comprising means to produce a flow of gas into the region which lies directly beneath the top film portion which is moving downwardly towards the receptacle and approaching the position where it engages the receptacle;

wall means including said top film portion confining the gas supplied by said second gas supply means and thereby developing a curtain of gas overlying the gas previously placed in the receptacle by said first gas supply means to prevent displacement of that previously placed gas as the receptacle moves to the next station;

said top film serving after engagement with the receptacle as the cover to hold the gas in the receptacle until said next station is reached; and

sealing means at said next station operable after said cover film has been placed over the receptacle to effect a hermetic seal between said cover film and the receptacle with the gas contained therein.

4,624,100

DEVICE FOR CONTINUOUSLY FEEDING (SYNCHRONIZING) ESSENTIALLY FLAT ARTICLES OF THE LUXURY-FOOD OR FOOD INDUSTRY, ESPECIALLY BARS OR STRIPS OF CHOCOLATE, TO A PACKAGING MACHINE

Hans Lesch, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

PCT No. PCT/EP84/00425, § 371 Date Aug. 12, 1985, § 102(e) Date Aug. 12, 1985, PCT Pub. No. WO85/03054, PCT Pub. Date Jul. 18, 1985

PCT Filed Dec. 21, 1984, Ser. No. 767,263

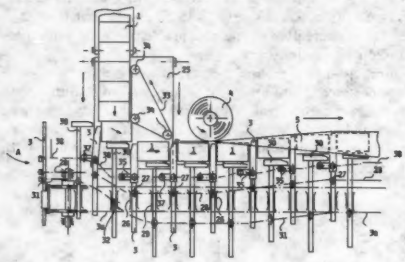
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1984, 3400172

Int. Cl.[4] B65B *35/24*

U.S. Cl. 53—550 **9 Claims**

1. Apparatus for continuously feeding synchronously substantially flat articles, particularly, bars or strips of chocolate,

to a packaging machine, comprising: transport means operating at constant speed and having carriers for introducing the articles into a tube of wrapping material and shaping the articles into individual packages; infeed means for the articles and operating transversely with respect to said transport means, said infeed operating synchronously with said transport means; said infeed means being positioned upstream of said transport means; buffers for the articles arriving on said infeed means and positioned between said carriers, said buffers being controlled



so that the articles will enter said tube of wrapping material in sequence and in a direction derived from infeed and transport directions; said buffers being separated from said carriers, said buffers and carriers having motions controlled independently of one another for inserting the articles into said tubes of wrapping material; said articles being moved away to a side from their initial transport direction and subsequently said articles being moved by a substantially small amount opposite to the initial transport direction, said articles being thereafter transported along a curved path.

4,624,101

PROCESS AND COMPOSITION FOR PREVENTING THE DISCOLORATION OF RADIATION STERILIZED CELLULOSIC MATERIAL EXPOSED TO ELEVATED POST-STERILIZATION TEMPERATURES

Bruce C. Marchioni, and Dan Posey, both of El Paso, Tex., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 24, 1984, Ser. No. 613,280
Int. Cl.[4] A61L *2/08*
U.S. Cl. 53—425 **13 Claims**

1. A process for sterilizing cellulosic material which is subject to possible subsequent exposure to undue thermal conditions, said process comprising the steps of:

prehumidifying said cellulosic material to a moisture content not less than 6.5% by weight which is sufficient to prevent discoloration of said cellulosic material during a subsquent irradiation step and further sufficient to prevent discoloration of said cellulosic material upon possible thermal conditions after irradiation;

sealing said cellulosic material from ambient conditions so as to maintain said cellulosic material at said moisture content; and

irradiating said cellulosic material with a sufficient radiation dosage to cause biological death.

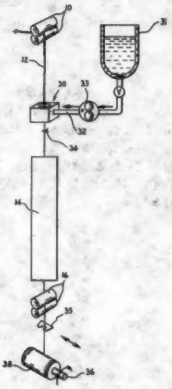
4,624,102

METHOD FOR REDUCING BROKEN FIBERS ON THE SURFACE OF A CARBON FIBER YARN BUNDLE

John H. Bell, Jr., Charlotte, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1985, Ser. No. 747,879
Int. Cl.[4] D02J *3/12*; D01H *13/30*; D02G *3/40*
U.S. Cl. 57—296 **5 Claims**

1. A method for reducing broken fibers on the surface of a carbon fiber yarn bundle comprising: supplying a liquid to a through passage in a jet at a controlled rate of from about 2.5 to about 5 gallons per minute in a path substantially tangential and perpendicular to said passage to provide a rimming flow within the passage; forwarding the carbon yarn bundle through said passage at a controlled speed and tension sufficient to center the carbon yarn bundle with the passage and to



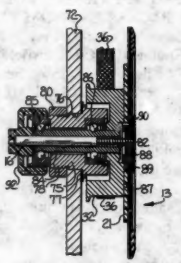
overcome any tendencies for the yarn bundle to twist in the jet passage; contacting the yarn bundle with said rimming flow of liquid as it passes through the jet passage to snap off some of said broken fibers and to wrap others back into said yarn bundle; and heating said yarn bundle to dry it.

4,624,103

BEARING ASSEMBLY FOR YARN FALSE TWISTING APPARATUS

Detlev Oberstrass, Tönisheide, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Division of Ser. No. 459,994, Jan. 21, 1983, Pat. No. 4,545,192, which is a continuation-in-part of Ser. No. 272,940, Jun. 11, 1981, Pat. No. 4,372,106, which is a continuation-in-part of Ser. No. 273,076, Jun. 12, 1981, Pat. No. 4,389,841, which is a continuation-in-part of Ser. No. 429,796, Sep. 30, 1982, Pat. No. 4,481,762. This application Aug. 20, 1985, Ser. No. 767,625
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022421; Jul. 9, 1980, 3025921; Dec. 23, 1980, 3048615; Jun. 5, 1982, 3221352; Jul. 24, 1982, 3227711; Sep. 10, 1982, 3233624
Int. Cl.[4] D02G *1/08*; D01H *1/241, 7/12*; F16C *35/08*
U.S. Cl. 57—348 **4 Claims**



1. A bearing assembly adapted for rotatably mounting a yarn twist imparting member in a false twisting apparatus or the like, and comprising

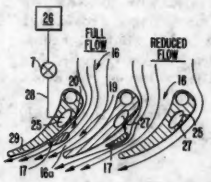
a tubular sleeve,
means for releasably mounting said sleeve in an aperture of a frame support member or the like,
a shaft extending coaxially through said sleeve and including one end disposed axially beyond said sleeve,
means at said one end of said shaft for mounting a yarn twist imparting member or the like thereto,
bearing means positioned between said shaft and sleeve for permitting relative rotation therebetween, said bearing means including a tubular bushing disposed coaxially about said shaft and extending along a substantial portion of the length thereof, and axially spaced apart bearings positioned between said bushing and said sleeve, said bushing extending axially beyond said sleeve at the end thereof adjacent said one end of said shaft, and
a drive pulley fixed to the end of said bushing adjacent said one end of said shaft, with said drive pulley including a planar end surface disposed perpendicularly to the axis of said shaft and bushing.

4,624,104

VARIABLE FLOW GAS TURBINE ENGINE

Sigmunn Stroem, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway

Filed May 15, 1984, Ser. No. 610,507
Int. Cl.[4] F02C *7/00*
U.S. Cl. 60—39.75 **8 Claims**



1. A variable flow gas turbine engine of the type having a combustor for generating combustion gases and a turbine rotor for receiving and expanding the hot combustion gases, comprising:
duct means for defining a channel for directing the flow of combustion gases from said combustor to said rotor;
vane means in said channel forming at least one throat;
means for varying the effective flow area for combustion gases flowing through said throat and impinging on said rotor, said varying means including winglet means fixedly mounted in said throat for separating the gases flowing through said throat into first and second streams; and
means for injecting high pressure fluid into said throat for varying the flow of combustion gases in one of said streams.

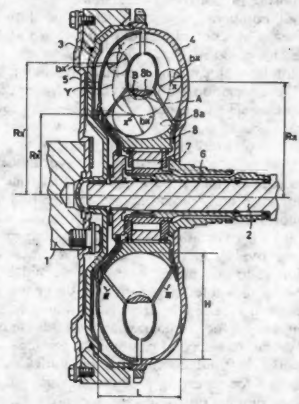
4,624,105

HYDRAULIC TORQUE CONVERTER

Sadanori Nishimura, and Noboru Sekine, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 466,323, Feb. 14, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 720,034
Claims priority, application Japan, Mar. 9, 1982, 57-35814
Int. Cl.[4] F16D *33/00*
U.S. Cl. 60—361 **2 Claims**

1. In an hydraulic fluid type torque converter having an impeller, a turbine and a stator arranged to form a torus, the improvement comprising, in combination: the impeller and the turbine being configured so as to satisfy the relationship R b=K, said stator having a plurality of vanes each shaped in the form of a wing having a thickened central portion in the direction of fluid flow forming fluid passages between said vanes of reduced width between said thickened central portions, said vanes having a longer radial height at said thickened central portions than upstream and downstream thereof and thereby forming fluid passages of substantially constant cross-sectional area of width multiplied by height along the length of the passage, and said stator being configured so as to satisfy the relationship R b≧K, where



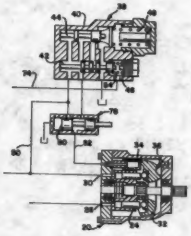
R equals the distance from the converter axis to the center of any circle located on a radial plane in each of the impeller, turbine and stator, which circle touches the inner and the outer walls of the torus,
b equals the diameter of each said circle; and
K is a constant,
whereby the meridian velocity of the hydraulic fluid on the median line for the impeller, the turbine, and the stator is maintained substantially constant.

4,624,106

PRESSURE-COMPENSATING HYDRAULIC SYSTEM FOR PREVENTING UNAUTHORIZED USE OF A MATERIAL HANDLING IMPLEMENT

Roger D. Mickelson, West Burlington, and Thomas R. Brown, Yarmouth, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 22, 1984, Ser. No. 592,371
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—452 **2 Claims**



1. A pressure-compensating hydraulic system for preventing unauthorized use of an associated material-handling implement, comprising:
variable displacement fluid pump means having movable swashplate means for varying the fluid flow from an outlet of said pump means by movement of said swashplate

means from a first relatively low-flow position to a second relatively high-flow position, means for biasing said swashplate means toward said second position, and hydraulic pump control means for acting against said swashplate in opposition to said biasing means for controlling the position of said swashplate means;

pressure-compensating means hydraulically joined to said pump means outlet and said hydraulic pump control means, said compensating means including means for sensing pressurized fluid demand of said system whereby said compensating means acts to position said swashplate means by control of fluid pressure in said pump control means responsively to fluid demand;

hydraulic motor means mounted on said implement in operative association with a movable member of said implement so that selective fluid pressurization of said motor means moves said member to a position wherein said implement is immobilized;

directional control valve means hydraulically joined with said pump means outlet and said hydraulic motor means for selectively directing pressurized fluid to and from said motor means; and

means for overriding said compensating means comprising selectively operable lock valve means hydraulically joined to said pump means outlet, said lock valve means being movable from a first position wherein said pump control means is hydraulically joined to said compensating means for normal demand-responsive operation of said system, to a second position for joining said pump means outlet in fluid communication with said pump control means for diverting pressurized fluid from said outlet to said pump control means for pressurization thereof in opposition to said biasing means to thereby maintain said swashplate means in said first low-flow position thereof when pressurized fluid demand for operation of said hydraulic motor means increases to substantially prevent the supply of pressurized fluid to said directional control valve means for operation of said motor means so that said movable member of said implement can be maintained in position for immobilizing said implement.

4,624,107

HYDRAULIC PRESSURE SOURCE DEVICE FOR HYDRAULIC BOOSTER OF AUTOMOBILE

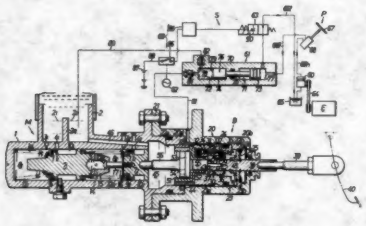
Makoto Horiuchi, Maruko, and Yoshitaka Miyakawa, Kawagoe, both of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Ueda and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sep. 16, 1985, Ser. No. 776,267

Claims priority, application Japan, Sep. 27, 1984, 59-202565

Int. Cl.[4] B60T *13/00*

U.S. Cl. 60—547.1 **4 Claims**



1. A hydraulic pressure source device for a hydraulic booster of an automobile including a hydraulic power steering device provided with a control valve, said control valve of the power steering device being connected via a high-pressure oil passage to a main hydraulic pump driven by an engine,

said hydraulic pressure source device comprising:

an auxiliary hydraulic pump having a working chamber and a pump chamber, said working chamber communicating with a low-pressure oil passage which connects said control valve with an oil tank, said pump chamber being adapted to perform repeated suction and discharge strokes in response to intermittent supply of an oil pressure to the working chamber,

a suction valve connecting said pump chamber to the oil tank;

a discharge valve connecting said pump chamber to an input hydraulic pressure chamber of a hydraulic booster;

an accumulator connected to a downstream side of the discharge valve;

an electromagnetic valve interposed in said low-pressure oil passage at a position downstream of said auxiliary hydraulic pump for opening and closing the low-pressure oil passage; and

an intermittent actuator connected to said electromagnetic valve to actuate the valve so as to be periodically opened and closed when a pressure within the accumulator goes down below a predetermined value.

4,624,108

HYDRAULIC BRAKE BOOSTER

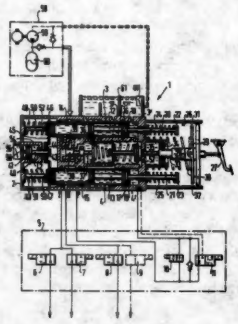
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 675,043

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409290

Int. Cl.[4] B60T *13/20*

U.S. Cl. 60—550 **21 Claims**



1. A hydraulic brake booster for a vehicle brake system, having a pressure supply apparatus comprising a pump and a reservoir, further having a control valve in a housing which monitors both a connection between the pressure supply apparatus and at least one main cylinder and a connection between the main cylinder and a relief location, and having a pedal-moved actuation plate, which is spaced apart from one end of a main cylinder piston, and having a reservoir pressure operating piston subjected to the reservoir pressure, characterized in that said at least one main cylinder is provided with a sleeve operable in a cylinder into which the main cylinder piston is inserted, and that said sleeve is exposed to an adjusting force which can be applied in a direction of said actuation plate by a restoring force spring and in the opposite direction therefrom by a restraining force of the reservoir pressure operating piston.

4,624,109

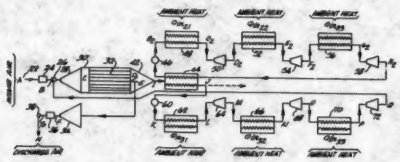
CONDENSING ATMOSPHERIC ENGINE AND METHOD

Michael A. Minovitch, 2832 St. George St., Los Angeles, Calif. 90027

Continuation-in-part of Ser. No. 297,087, Aug. 27, 1981, abandoned. This application Aug. 12, 1983, Ser. No. 522,847

Int. Cl.[4] F01K *17/00*

U.S. Cl. 60—648 394 Claims



1. A method for converting a portion of the natural thermal energy of atmospheric air into mechanical work comprising the steps of:

expanding air taken from the atmosphere inside a low pressure expansion chamber;

extracting a portion of the thermal energy from said expanding air and converting it into mechanical work by moving a movable member inside said expansion chamber;

condensing a portion of said expanded air at cryogenic temperatures; and

recompressing that portion of said expanded air that does not condense.

4,624,110

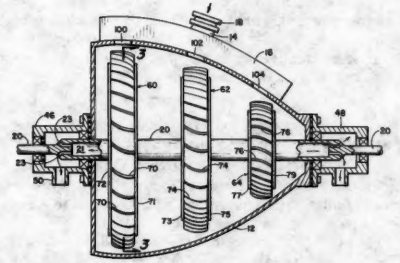
FLUID POWERED TURBINE

Harry H. Levites, 309 S. Washington Dr., Sarasota, Fla. 33577

Filed May 17, 1985, Ser. No. 735,126

Int. Cl.[4] F01K *7/00*

U.S. Cl. 60—670 4 Claims



1. A pressure fluid actuated power plant comprising:

a housing;

a hollow shaft rotatably supported in said housing and sealably extending outward of the housing;

a plurality rotatable turbine wheels of various diameter attached to said shaft inside said housing, said turbine having a plurality of pairs of spaced blades, said space between said pair of blades communicating with an opening in the shaft to permit flow of said pressure fluid from between the blades into the hollow interior of said shaft;

nozzle means connected to said housing to selectively direct said pressure fluid into a selected turbine wheel blades to cause said rotation of said turbine wheel and exhaust said pressure fluid at a lower pressure into said hollow interior of said shaft;

means to direct said exhaust pressure fluid from said shaft to a means to reform said steam to a given pressure and to recycle said steam back to said housing.

4,624,111

PRESEPARATOR FOR A PIPE CARRYING A TWO-PHASE MIXTURE

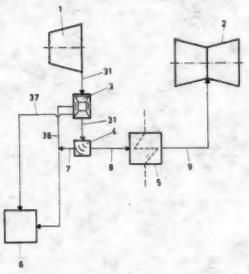
Helmut V. Lang, Plainsboro, N.J., assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 8, 1985, Ser. No. 720,732

Claims priority, application Switzerland, Apr. 16, 1984, 1899/84

Int. Cl.[4] F01B *31/30*

U.S. Cl. 60—694 2 Claims



1. A preseparator for separating water from steam comprising:

an outer pipe and a first internal pipe positioned within the outer pipe, the first internal pipe having a constriction,

an upstream end of the first internal pipe being spaced from the outer pipe so as to form an annular gap adapted to admit flow with an absence of a substantial variation of velocity, adjacent portions of the outer pipe and the first internal pipe forming an inter-space therebetween;

at least one additional internal pipe positioned downstream of the annular gap and between the first internal pipe and the outer pipe so as to divide the inter-space into chambers; and

first and second ports provided in said outer pipe and communicating with at least one of said chambers.

4,624,112

AUTOMOTIVE AIR CONDITIONER CHARGING STATION WITH OVER-RIDE CONTROLS

Robert H. Proctor, Baltimore, Md., assignor to Murray Corporation, Cockeysville, Md.

Filed Aug. 26, 1985, Ser. No. 769,961

Int. Cl.[4] F25B *45/00*

U.S. Cl. 62—149 23 Claims

1. In an air conditioner charging station for evacuating and subsequently charging an air conditioner which includes a compressor having high and low pressure sides, and wherein the charging station includes oil and refrigerant reservoirs and a vacuum pump;

(a) an electrically operated dump valve,

(b) conduits for connecting said oil reservoir, said refrigerant reservoir, said vacuum pump and said dump valve to the high and low pressure sides of said air conditioner,

(c) electrically operated valve means in said conduits, and

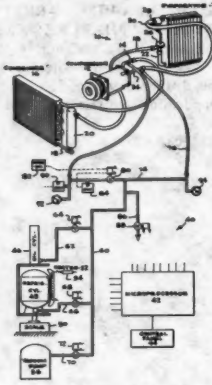
(d) electronic sequencing means connected with said electrically operated valves for generating signals for sequentially connecting:

(i) said dump valve to said high and low pressure sides of the compressor for dumping fluid from said high and low pressure sides,

(ii) said vacuum pump to said high and low pressures sides

of the compressor for evacuating fluid from said high and low pressure sides,

(iii) said oil reservoir only to said low pressure side, and



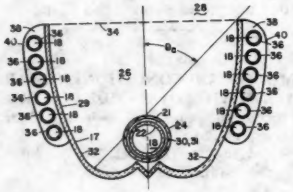
(iv) said refrigerant reservoir simultaneously to said high and low pressure sides of the compressor.

4,624,113

PASSIVE-SOLAR DIRECTIONAL-RADIATING COOLING SYSTEM

John R. Hull, Hinsdale, and William W. Schertz, Batavia, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 27, 1985, Ser. No. 749,231
Int. Cl.[4] F25B *23/00*
U.S. Cl. 62—467 **13 Claims**



1. A cold-producing device comprising,

an infrared radiating body including a radiating surface aimed at the sky and capable of emitting rays within one or more wavelength bands for which the atmosphere is transparent,

a cover spaced apart from the radiating surface towards the sky and transparent to said one or more wavelength bands,

the cover being thermally isolated from the radiating surface by a vacuum to reduce the formation of condensation on the cover when the radiating surface is a temperature below the dewpoint of the atmosphere, and

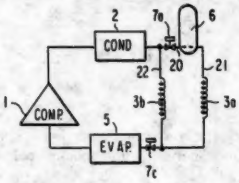
a housing supporting the radiating body and cover, the housing including means for thermally coupling the radiating body to an ice-storage reservoir.

4,624,114

DUAL REFRIGERANT COOLING SYSTEM

Kiyoshi Sakuma; Yoshiaki Tanimura, both of Shizuoka, and Naoki Tanaka, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 588,011, Mar. 9, 1984, Pat. No. 4,580,415.
This application Jan. 30, 1986, Ser. No. 824,322
Claims priority, application Japan, Apr. 24, 1983, 58-70953; Apr. 24, 1983, 58-70954; Apr. 24, 1983, 58-70955
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—502 **6 Claims**



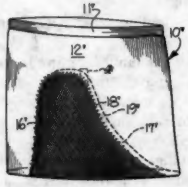
1. A dual, discrete mode refrigeration system, comprising: a compressor (1), a condenser (2), expansion means (3) and an evaporator (5) connected in series with each other; a heteroazeotropic refrigerant mixture comprising a high boiling point refrigerant and a low boiling point refrigerant charged into the system, a liquid-gaseous fractionating vessel (6) disposed in a predetermined portion of said system for separating out and retaining the low boiling point refrigerant in a gaseous phase during system operation in an ordinary freezing mode, with both refrigerants circulating through the system during operation in a rapid freezing, super-low temperature mode, an electromagnetic valve (7) mounted in an inlet side of said system for selectively changing the refrigerant path to implement either said rapid freezing mode or said ordinary freezing mode, a fractionating filler (8) disposed within said vessel intermediate upper and lower ends thereof, and a refrigerant pipe (20, 21) leading from an outlet of said valve through said vessel and interrupted within said vessel for circulating both refrigerants therethrough to implement the gaseous phase separation and retentive isolation of the low boiling point refrigerant in the ordinary freezing mode.

4,624,115

SEAMLESS BLANK FOR BODY GARMENT AND METHOD OF FORMING SAME

Sam C. Safrit, Pfafftown; Roscoe M. Farrell, Pittsboro, and Melvin C. Euliss, Burlington, all of N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

Filed Mar. 25, 1985, Ser. No. 715,823
Int. Cl.[4] A41B *9/02, 9/04;* D04B *1/24*
U.S. Cl. 66—172 R **5 Claims**



1. A seamless knit tubular blank for use in forming a body garment, said blank comprising a first fabric portion adapted to define at least one panel of the body garment and at least one second fabric portion adapted to be cut away and removed from said first fabric portion to impart to said first fabric portion the requisite shape for use of said first fabric portion in

forming the body garment, said first fabric portion of said blank being knit of a first stitch loop construction, and said second fabric portion being knit of a second stitch loop construction extending throughout the entire area of said second fabric portion, said first and second stitch loop constructions providing a visually detectable different appearance along the juncture between said first and second fabric portions, said second stitch loop construction being formed in selected wales of selected courses and forming a sinuous guide line for cutting and removal of said second fabric portion to impart said requisite shape to said first fabric portion.

4,624,116

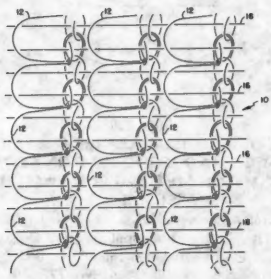
LOOP PILE WARP KNIT, WEFT INSERTED FABRIC

Jack S. Rogers, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 559,939, Dec. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 365,535, Apr. 5, 1982, abandoned. This application Apr. 8, 1985, Ser. No. 720,953

Int. Cl.[4] D04B *23/08, 23/12;* **A44C** *18/00*

U.S. Cl. 66—193 **1 Claim**



1. An interlocking, readily separable closure member comprising: a male member having a plurality of hooks on one side thereof and a female member having a plurality of loops upstanding therefrom engaged by said hooks, said female member having a two-bar warp knit fabric having a face side and a back side, said face side of said fabric having a plurality of spaced wales of chain stitches, said back side of said fabric having a plurality of spaced wales of tricot stitches with a lap portion of each of said tricot stitches projecting outwardly therefrom to form a free loop connected only at its base to its respective wale, and a weft yarn inserted into each course of said fabric between the face and back side of said fabric and extending across the full width of said fabric in the weft direction and held substantially parallel to one another by said chain stitches, the faceside of said warp knit fabric being coated with an acrylic latex.

4,624,117

REMOVABLE SHIPPING RESTRAINT SYSTEM FOR APPLIANCES

William F. Ory, Coloma Township, Berrien County; Paul R. Staun, and Robert M. Weir, both of St Joseph Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 5, 1985, Ser. No. 698,541

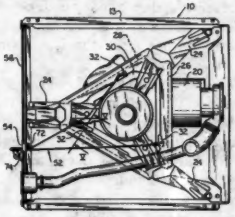
Int. Cl.[4] D06F *39/00*

U.S. Cl. 68—3 R **16 Claims**

1. A shipping restraint system for an appliance having a cabinet with vertical sidewalls, a horizontal bottom wall for resting on a floor and a plurality of suspension components including overlying plate members which are movable relative to one another within said cabinet, comprising:

restraining means for interlocking said components in a fixed relationship; and,

means for selectively releasing said restraining means from the exterior of said cabinet comprising a cable connected to said restraining means for selectively disengaging said restraining means from said components;



said cable including a free end which extends outward through an aperture in said cabinet.

4,624,118

WASHING MACHINES

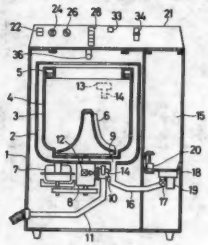
Kiichiro Yamakawa, Moriyama; Kenji Yamamoto, Kusatsu; Takao Kuraseko; Tadashi Nukaga, both of Otsu, and Koichi Yoshizaki, Kusatsu, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Jun. 15, 1984, Ser. No. 621,366

Claims priority, application Japan, Jun. 20, 1983, 58-111307; Jun. 24, 1983, 58-114717

Int. Cl.[4] D06F *39/08*

U.S. Cl. 68—12 R **1 Claim**



1. A washing machine having a water store tank comprising:

a machine main body,

an outer tank disposed to said main body,

a washing tank rotatably supported within said outer tank and also serving as a water extraction tank,

water feed means to said washing tank,

a top cover for said washing tank,

an agitator disposed to the inside of said washing tank,

rotational means for rotating said washing tank,

a water store tank disposed to the washing machine main body,

forward and backward water transfer means for transferring laundry water between said water store tank and said washing tank to each other,

draining means for draining laundry water in the washing tank; and

control means for automatically actuating each of said means, wherein said control means gives an instruction to each of said means so as to carry out,

a first step of charging washing products into laundry water in the washing tank and keeping them for a predetermined period of time in laundry water and optionally rotating the agitator by the actuation of the rotational means for said agitator during said predetermined period,

a second step of transferring laundry water in the washing tank by means of the actuation of the forward water transfer means from the washing tank to the water store tank to store water in the latter,

a third step of transferring laundry water stored in the water store tank by means of the actuation of the backward water transfer means from the water store tank to the washing tank,

a fourth step of extracting water from the washing products by the actuation of rotational means for the washing tank between the second step and the third step in at least one cycle during repitition of the first through third steps in this order for more than one cycle, and

a fifth step of draining laundry water by the actuation of the draining means,

wherein at least the washing tank has a detection means that judges the presence or absence of water and issues an indication signal therefor,

wherein the water drain means is stopped if a signal from the detection means of the washing tank does not change within a predetermined of period in the fifth step,

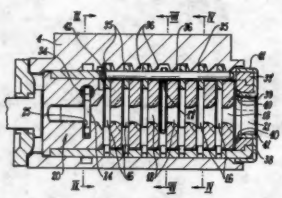
wherein the water draining means is released from its stopping state by the opening and closing operation of the top cover for the washing machine.

4,624,119

TUMBLER LOCK

Donald J. Newman, Somerville, and Gerald F. Dunphy, Glen Waverley, both of Australia, assignors to Ogden Industries Pty. Ltd., Victoria, Australia

Filed Oct. 19, 1983, Ser. No. 543,276
Claims priority, application Australia, Oct. 27, 1982, PF6545
Int. Cl.[4] E05B *29/02*
U.S. Cl. 70—366 **14 Claims**



2. A cylinder lock including:

a body having a cylindrical bore therein,

a barrel mounted within said bore for rotation relative to said body and including a cylindrical sleeve,

a plurality of tumbler plates carried by said barrel so as to rotate therewith and each being arranged generally transverse to the rotational axis of said barrel,

a plurality of locking recesses formed in a surfaces of said bore, each said tumbler plate being movable laterally relative to said barrel to adopt either a barrel-lock position or a barrel-release position, and a peripheral portion of at least two of said tumbler plates engaging within a respective one of said locking recesses when those plates are in the barrel-lock position to hold said barrel against rotation relative to said body and also to hold said barrel against axial separation from said body in at least one direction,

a locking pin which extends in the axial direction of said barrel and interconnects said tumbler plates so that they move in unison between said barrel-lock and barrel-release positions,

a plurality of discs rotatably mounted within said barrel sleeve, each having a particular rotational position relative to said sleeve at which it allows movement of said locking pin and said tumbler plates towards said barrel-release position, each said disc being operative when not in said particular rotational position thereof to interact with said pin and thereby prevent said movement into said barrel-release position,

a plurality of circumferentially-extending slots formed through a wall of said barrel sleeve, each said tumbler plate having a body part contained within said sleeve, the peripheral portion thereof being a lobe which projects laterally from said body part and slidably locates within a respective said slot in both said barrel-lock and barrel-release positions, said tumbler plates and said discs being alternately located in face-to-face relationship along the axis of said body,

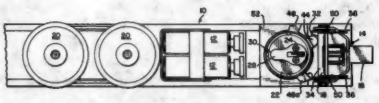
an opening existing through each said disc and the body part of each said tumbler plate so that a key can be passed through said discs and tumbler plates, and each said disc opening being arranged to cooperate with the key so that the discs are responsive to passage of said key to adopt said particular rotational positions thereof.

4,624,120

KEY-OPERATED, EXIT ALARM, SWITCH CAM ASSEMBLY AND MODIFICATION KIT AND MODIFICATION METHOD FOR SWITCH CAM ASSEMBLIES

Herbert W. Hoffman, New Palestine; Richard B. Cohrs, and William P. Dye, both of Indianapolis, all of Ind., assignors to Van Duprin, Inc., Indianapolis, Ind.

Filed Sep. 18, 1985, Ser. No. 777,359
Int. Cl.[4] E05B *17/04*
U.S. Cl. 70—380 **17 Claims**



1. A key-operated, exit alarm, switch cam assembly having (a) first means defining a platform; (b) a spring-biased, rotary, switch cam, having a bearing surface formed thereon, mounted on said platform for rotation between a given, alarm-silenced disposition, and another, normal, alarm-triggered disposition; and (c) second means defining a key-receiving, mortise cylinder having a tailpiece rotatable through a given plane, for engaging said bearing surface and rotating said cam to said given, alarm-silenced disposition; comprising:

a cam retainer, coupled to one of said first and second means, and having means for arrestingly engaging said bearing surface to prevent rotation of said cam from said given disposition to said another, normal disposition; wherein

said cam retainer is mounted to said one means and is movable, relative to said one means, between a first attitude in which said bearing surface-engaging means thereof is arrestingly engaged with said bearing surface, and a second attitude in which said bearing surface-engaging means is removed from said bearing surface, to allow said cam to rotate from said given disposition to said another, normal disposition; and

said tailpiece comprises means for moving said cam retainer from one of said first and second attitudes to the other thereof.

4,624,121

METHOD OF, AND APPARATUS FOR PRODUCING MULTI-DIMENSIONALLY BENT ELONGATE ARTICLES

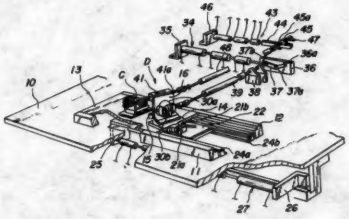
Motohiko Kitsukawa, and Atsuo Suzuki, both of Yokohama, Japan, assignors to Hashimoto Forming Industry Co., Ltd., Yokohama, Japan

Filed Jan. 29, 1985, Ser. No. 696,157

Claims priority, application Japan, Jan. 30, 1984, 59-14793; Jan. 30, 1984, 59-14794; Jan. 31, 1984, 59-15925; Jan. 31, 1984, 59-15926; Jan. 31, 1984, 59-15927; Jan. 31, 1984, 59-15928; Sep. 28, 1984, 59-203868

Int. Cl.[4] B21D *11/14*

U.S. Cl. 72—65 30 Claims



1. An apparatus for producing multi-dimensionally bent articles, including a retaining device for laterally retaining a continuously supplied elongate material while permitting the material to slide longitudinally thereof, and a bending device arranged behind the retaining device, for multi-dimensionally bending the material, wherein the bending device comprises a base member, a bottom plate pivotably mounted on the base member so as to be angularly movable about a vertical axis, a vertical plate fixedly mounted on the bottom plate at right angle to the longitudinal axis of the material, horizontal bending means mounted on the vertical plate, for laterally retaining the material and permitting passage of the material therethrough, a vertical bending means arranged behind the horizontal bending means and pivotably mounted with respect to the vertical plate such that the vertical bending means is angularly movable about a horizontal axis.

4,624,122

MACHINE FOR THE MANUFACTURE OF TUBES DEFORMED TO PROVIDE A HELICOIDAL PROFILE FOR HEAT EXCHANGERS AND SIMILAR APPLICATIONS

Robert Bridier, Culoz, France, assignor to Compagnie Industrielle d'Applications Thermiques C.I.A.T., Culoz, France

Filed Oct. 1, 1985, Ser. No. 782,330

Claims priority, application France, Oct. 2, 1984, 84 15263

Int. Cl.[4] B21D *15/04*

U.S. Cl. 72—70 2 Claims

1. A machine for corrugating smooth tubing to manufacture corrugated tubing for heat exhangers and the like and for cutting the corrugated tubing off to provide a desired length, comprising:

(a) head means having an axial opening therethrough;

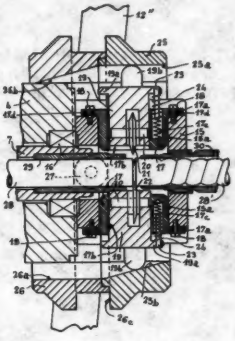
(b) means for feeding tubing axially through said opening in the head means at a controlled rate;

(c) means for imparting relative rotation between the head means and the tubing;

(d) corrugating knurl means in said head means mounted for radial displacement inwardly to contact and corrugate the tubing and outwardly away therefrom;

(e) cutting knurl means in said head means mounted for radial displacement inwardly to contact and cut off the tubing and outwardly away therefrom; and

(f) displacement means operatively associated with the head meand and the knurl means and selectively movable between a corrugation position in which it displaces only the corrugating knurl means radially inwardly and a cutting



position in which it displaces only the cutting knurl means radially inwardly and a neutral position in which the knurl means are all displaced radially outwardly.

4,624,123

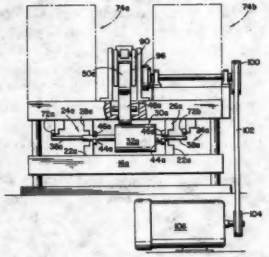
STRAIGHTENING MACHINE FOR MOTOR ARMATURE ASSEMBLIES AND THE LIKE

Nicholas J. Marracino, Torrington, Conn., assignor to Bertolette Machines, Inc., Torrington, Conn.

Continuation-in-part of Ser. No. 731,754, May 7, 1985, abandoned, which is a continuation of Ser. No. 537,797, Sep. 30, 1983, abandoned. This application Nov. 4, 1985, Ser. No. 794,754

Int. Cl.[4] B21D *3/16*

U.S. Cl. 72—110 19 Claims



1. A machine for straightening cylindrical workpieces having diametrically enlarged intermediate sections and reduced diameter opposite end sections coaxial with the intermediate sections; said machine comprising first and second bearing units aligned axially and spaced apart axially for engagement and support of said reduced diameter opposite end sections of a workpiece with at least one of said end sections projecting axially substantially beyond its associated bearing unit, said bearing units being radially separable for movement between open and closed positions for the radial introduction and retention of said workpiece end sections therein, power operated rotary drive means mounted for radial floating operation whereby to firmly engage said diametrically enlarged intermediate section of a workpiece held by said bearing units irrespective of slight variation in diameter and thus to positively rotate said workpiece during straightening thereof, and a radially movable deflection device engageable with said projecting end section of said workpiece during rotation thereof to bend the same out of axial alignment with the remaining sections of the

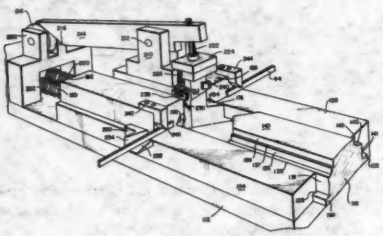
workpiece and to return the same to a condition of axial alignment at a relatively slow and closely controlled rate of movement.

4,624,124

ARMATURE COIL FORMING MACHINE

Miquel A. Reyes, 555 W. 151st St., Miami, Fla. 33169, and Enivaldo Alfonso, 1240 W. 37th St., Apt. 202, Hialeah, Fla. 33012

Filed Dec. 17, 1984, Ser. No. 682,148
Int. Cl.[4] B21D *7/02*
U.S. Cl. 72—403 4 Claims



1. A machine for forming an armature coil and the like comprising:

a supporting frame (12),

attachment plate means (112) fixed to said frame (12)

a die head (118) of generally rectangular configuration slidably carried by said plate means (112) for reciprocating movement along a horizontal longitudinal axis,

said die head (118) having a pair of side walls, a leading end (150) of generally V-shaped configuration and an opposite end,

pneumatically operated means (114) including an operating plunger (116) connected to the opposite end of said die head (118) for movement thereof;

an edge (135, 145) on each side wall of said die head (118) sloping away from its side wall throughout its entire length from the leading end (150) to the opposite end,

said leading end (150) including a central vertical axis dividing upper (152, 162) and lower (162, 164) portions on each side of the central vertical axis, a ledge (166) sloping from the edge (135) on its side wall to the cental axis and a ledge (156) sloping from the edge (145) on its side wall to the central axis, said ledges (166, 156) being offset from each other and are joined to each other at the central vertical axis,

socket means carried by said plate means and including a slide block (169), a retaining bar on each side of said block having a cut-out portion (182, 184) whereby portions of the sloping edges (135, 145) slide into the cut-out portions (182, 184),

spring means (200, 202) operatively disposed to normally bias said slide block (169) toward the V-shaped end (150) of said die head (118)

punch means (230, 232) mounted on said socket means for reciprocating movement therewith,

lever means (214) pivotally mounted on said slide block (169) and having a pair of opposite ends with one end engaging said punch means for moving the same vertically toward said ledges (156, 166) on the V-shaped end (150) of said die head (118), and

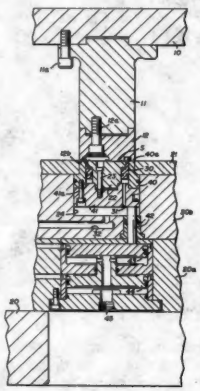
camming means (218) fixed to said attachment plate means (112) and being engaged by the other end (216) of said lever means (214) for vertically depressing said punch means toward said ledges (156, 166) on the V-shaped end of said die head (118) after the pneumatically operated means (114) has moved the die head (118) horizontally into said socket means.

4,624,125

METHOD AND APPARATUS FOR CONTROLLING THE SPACING BETWEEN A METAL FORMING PUNCH AND A COMPLEMENTAL DIE

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Feb. 11, 1985, Ser. No. 700,040
Int. Cl.[4] B21D *22/12, 45/04, 51/44*
U.S. Cl. 72—453.13 6 Claims



1. A method of forming a workpiece in a press having at least one movable slide and a fixed platen by controlling the space between a metal forming punch carried by the slide and a complemental die carried by the fixed platen comprising the steps of:

(a) supporting a central portion of the workpiece on a central portion of a fluid supported die pad means supported by a predetermined fluid pressure;

(b) supporting the periphery of the workpiece on a first fluid supported sleeve supported by a predetermined fluid pressure and surrounding the central portion of the die pad means;

(c) engaging the workpiece with the forming punch against the central portion of the die pad means and engaging a second fluid supported sleeve with an outer peripheral portion of the punch to define a space between the punch and the central portion of the die pad means; and

(d) overcoming the fluid pressure supporting the die pad means and the second sleeve by further movement of the punch to move the second fluid supported sleeve and the die pad means together while maintaining the defined space between the pad and the punch.

4,624,126

HYDRAULIC PRESS

Robert M. Avila, 249 Calle Esmarca, San Clemente, Calif. 92672, and Glenn A. Hoffman, Jr., 8362 Seaport Dr., Huntington Beach, Calif. 92764

Filed Sep. 26, 1985, Ser. No. 780,639
Int. Cl.[4] B21J *9/18*
U.S. Cl. 72—453.14 19 Claims

13. In a hydraulic press having a bed means and a platen means moveable in generally parallel relation to one another by means of at least first and second generally identical hydraulic cylinders, the improvement of pressure actuating means comprising:

a ram member having a first section having a predetermined cross-sectional area and a second axially aligned section having a pre-determined smaller cross-sectional area, each

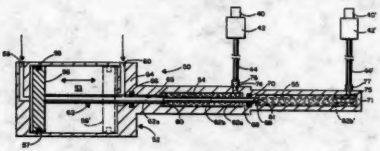
of said first and second section having a substantially identical effective cross-sectional surface area in the direction of axial movement of said ram member;

a first fluid-filled chamber having a peripheral wall portion and first and second end wall means;

a second fluid-filled chamber sharing said second end wall means adjacent to and axially aligned with said first chamber, said second chamber having a length generally equal to that of said first chamber and a third end wall means opposite said second end wall means;

a first centrally positioned axially extending opening in said first end wall means, said first opening being configured for matingly slidably receiving said first ram section therethrough;

a second centrally positioned axially extending opening in said second end wall means, said second opening being



configured for matingly slidably receiving said second ram section therethrough, each of said sections having a length sufficient for axial operation within its respective chamber between first and second positions, the dimensions of said first and second chambers being predetermined relative to said effective surface area for providing substantially identical fluid displacement in each said chamber upon axial movement of said ram member between said first and second positions;

a first fluid flow path interconnecting said first chamber to said first cylinder;

a second fluid flow path interconnecting said second chamber to said second cylinder; and

means for axially displacing said ram member for actuating said first and second cylinders simultaneously for providing relative displacement between said bed means and said platen means.

4,624,127

METHOD AND APPARATUS FOR MEASUREMENT OF THICKNESS UTILIZING ULTRASONIC PULSES

Isao Narushima, Tokyo, and Morio Nakano, Kanagawa, both of Japan, assignors to Teitsu Denshi Kenkyusho Co., Ltd., Kawasaki, Japan

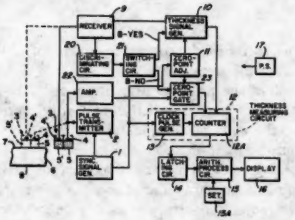
Filed Jun. 17, 1981, Ser. No. 274,453

Claims priority, application Japan, Feb. 17, 1981, 56-21952

The portion of the term of this patent subsequent to Dec. 25, 2000, has been disclaimed.

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—1 DV **7 Claims**



1. A method for measurement of the thickness of a workpiece comprising the steps of periodically transmitting ultrasonic pulses into a workpiece from one or an upper surface thereof and receiving ultrasonic echo pulses reflected from the bottom surface thereof by means of a probe provided at its front surface with a delay material, measuring the period of time corresponding to the period of time elapsed from the time of transmission of each ultrasonic pulse to the time of reception of its related echo pulse minus the period of time specified by a zero-point adjusting circuit, calculating the thickness of the workpiece from such measured time periods, and displaying the thickness value thus calculated on a display, characterized in that, during the zero-point adjustment operation, the probe is kept separated from the workpiece, the period of time elapsed from the time of reception of an ultrasonic echo pulse reflected from the front surface of the delay material to the time of generation of an adjusting pulse by the zero-point adjusting circuit is measured so that the result of calculation obtained on the basis of such measurement is displayed on the display, and the setting of the zero-point adjusting circuit is adjusted until the value displayed on the display with the probe kept separated from the workpiece becomes substantially zero, and thereafter the measurement of the thickness of the workpiece is effected while causing the probe to contact the workpiece.

4,624,128

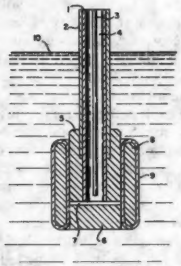
HYDROGEN PROBE

John F. Pelton, Yorktown, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 18, 1985, Ser. No. 746,086

Int. Cl.[4] G01N *7/10*

U.S. Cl. 73—19 **1 Claim**



1. A probe for measuring the content of hydrogen in a melt containing aluminum or alloys thereof comprising the following components in combination:

(i) a straight first tube open at both ends;

(ii) a straight second tube open at both ends and fixed within the first tube in such a manner that a passage is provided between the outer wall of the second tube and the inner wall of the first tube;

(iii) a woven ceramic fiber sleeve surrounding, and in contact with, part of the first tube, the sleeve running from above the uppermost point of the first tube exposed to the melt to a point between the uppermost point of the upper plug referred to as component (iv) and the lower end of the first tube;

(iv) an upper plug surrounding the bottom portion, but not the lower open end, of the first tube, the upper part of the plug being in contact with the lower part of the sleeve and the lower part of the plug being in such close contact with the first tube that gas is essentially unable to pass therethrough;

(v) a lower plug bearing a spaced and fixed relationship to the lower open ends of the upper plug and the first tube; and

(vi) a straight third tube, open at both ends, having a woven ceramic blanket covering the outer wall, and at least those

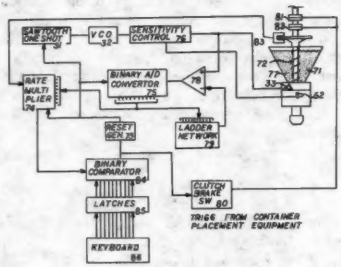
portions at each end of the inner wall, thereof, the blanketed third tube surrounding, and in contact with the upper and lower plugs wherein the contact between the blanketed third tube and the upper and lower plugs is so close that the melt is essentially unable to pass therethrough.

4,624,129

ACOUSTICAL DRY PRODUCT DENSITY SENSOR

Joel E. Haynes, 18316 Oxnard St., Tarzana, Calif. 91356

Filed Apr. 15, 1985, Ser. No. 723,476
Int. Cl.[4] G01N *9/00*
U.S. Cl. 73—32 A **8 Claims**



1. In combination with an auger-type product dispensing machine, a device for adjusting the volume of product dispensed as a function of the density of product near the bottom of the filler cone of said dispensing machine in order to dispense an accurate amount of weight of said product comprising:

(A) at least one measuring pair of acoustical resonators, one resonator of each pair being a driving resonator, the other being a driven resonator, said pair being positioned near the bottom of said filler cone so that the sensing surface of said driving resonator is in acoustical contact with said product, said driven resonator being mechanically coupled to said driving resonator so that a vibration produced by said driven resonator will induce a signal voltage in said driven resonator, said signal voltage being used in a feedback loop to vary the voltage fed to said driven rsonator in order to maintain the magnitude of vibration produced by said driven resonator essentially constant; and

(B) means for equating changes in the voltage level required to maintain a constant magnitude of ultrasonic vibration output from said driven resonator with changes in the density of said product.

4,624,130

METHOD FOR DETERMINING BOREHOLE OR CAVITY CONFIGURATION THROUGH INERT GAS INTERFACE

Donald Faul, Sunset; Paul P. Broussard, Lafayette, and Donald W. Granger, Lake Charles, all of La., assignors to Testrac, Inc., Lake Charles, La.

Continuation of Ser. No. 599,290, Apr. 11, 1984, Pat. No. 4,523,453, which is a continuation-in-part of Ser. No. 390,321, Jun. 21, 1982, Pat. No. 4,455,869. This application Jun. 13, 1985, Ser. No. 744,376
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—40.7 **6 Claims**

1. An apparatus for determining the configuration of a borehole or cavity, which comprises:

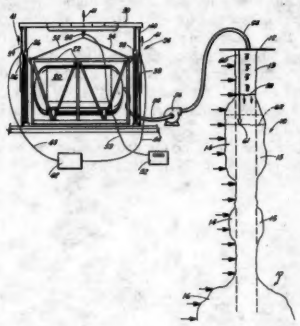
a. a relatively inert fluid;

b. means for containing the relatively inert fluid under a given pressure;

c. means for transporting a portion of the fluid under a known temperature and pressure down into the borehole or cavity to be measured;

d. means for quantifying the weight of fluid being transported into the borehole or cavity; and

e. means for indicating the linear vertical movement of the



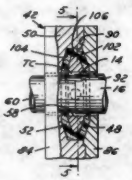
fluid down the borehole or cavity at predetermined intervals within the borehole or cavity so that the area occupied by the fluid under the known temperature and pressure within at least one of the intervals can be determined as a function of the change in weight of fluid within the interval.

4,624,131

METHOD OF AND APPARATUS FOR TESTING PIPE

Albert E. Holm, Marine City, and Dennis J. Dorman, Carsonville, both of Mich., assignors to Testrite, Inc., Marine City, Mich.

Filed Sep. 6, 1985, Ser. No. 773,440
Int. Cl.[4] G01M *3/28*
U.S. Cl. 73—46 **13 Claims**



1. The method of testing a wall area of a pipe for leakage comprising the steps of:

encircling the pipe opposite the area to be tested with an anvil ring spaced radially outwardly therefrom by bringing the ends of complementary ring segments into end-abutting relation about the pipe;

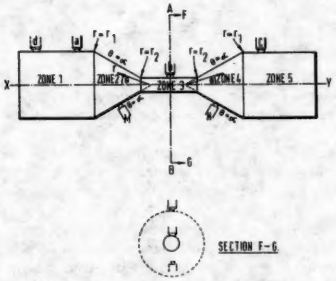
squeezing an elastomeric seal against the surface of the anvil ring in a direction and at locations to displace the elastomer radially inwardly at axially opposite ends of the area to be tested to fill the gaps between the anvil ring and the pipe to form a hermetically sealed test chamber therebetween; and

reading a change in pressure in the sealed test chamber as a function of pipe leakage.

4,624,132
RHEOMETER

John Parnaby, 65 Silhill Hall Road, Solihull, West Midlands, and Christopher A. M. Humphries, 57 Tormead Road, Guildford, Surrey, both of England

Filed Apr. 11, 1985, Ser. No. 722,165
Claims priority, application United Kingdom, Apr. 12, 1984, 8409502
Int. Cl.[4] G01N *11/08*
U.S. Cl. 73—55 7 Claims



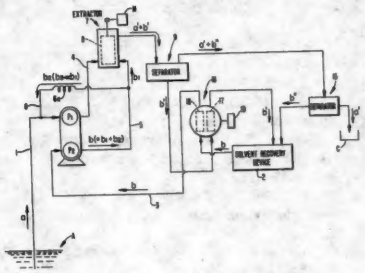
1. A method of determination of extensional viscosity and elasticity of a visco-elastic fluid, said method comprising:
passing the fluid through an apparatus comprising a conduit having a converging portion and a diverging portion;
measuring the drop in fluid pressure resulting from flow through the converging portion, which pressure drop comprises contributions from fluid elasticity, extensional viscosity and shear viscosity;
measuring the change in fluid pressure resulting from flow through the diverging portion at predetermined sites wherein the increase in elastic energy of the fluid which occurs in the converging portion equals the decrease in elastic energy which occurs in the diverging portion, which pressure change comprises contributions from fluid elasticity, extensional viscosity and shear viscosity;
measuring the shear viscosity relationship of the fluid;
making a quantitative separation of those pressure change effects which are due to fluid elasticity and those which are due to a combination of extensional viscosity and shear viscosity;
and calculating the fluid elasticity and extensional viscosity relationships.

4,624,133
APPARATUS FOR DETERMINING THE CONCENTRATION OF OIL IN ANOTHER LIQUID

Yoshiaki Iwashita, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Apr. 23, 1985, Ser. No. 726,379
Claims priority, application Japan, Apr. 24, 1984, 59-82313
Int. Cl.[4] G01N *33/18*
U.S. Cl. 73—61.1 R 5 Claims

1. An apparatus for determining the concentration of oil in another liquid, comprising:
an oil extracting apparatus for mixing a sample of oil containing liquid and an oil-extracting solvent;
a source of solvent;
solvent pump means having the intake side connected to said source of solvent and the discharge side connected to said oil extracting apparatus for pumping oil extracting solvent from said source of solvent along a solvent flow path into said oil extracting apparatus;
water pump means having the discharge side connected to said oil extracting apparatus for pumping a liquid containing oil therein into said oil extracting apparatus;
a separator means connected to said oil extracting apparatus for receiving the mixture of oil, water and solvent from said oil extracting apparatus and separating the oil-containing solvent therefrom;
an analyzer means connected to said separator means for receiving the oil-containing solvent and analyzing it for oil content; and

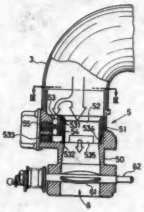


solvent supply pipe means connected between said solvent flow path and the intake side of said water pump means and including a control means therein for limiting the amount of solvent flowing therethrough to an amount less than supplied from said solvent pump means to said oil extracting apparatus.

4,624,134
HOT-WIRE AIR-FLOW METER

Masami Nagano, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 14, 1984, Ser. No. 671,412
Claims priority, application Japan, Nov. 16, 1983, 58-213939
Int. Cl.[4] G01N *15/00*
U.S. Cl. 73—118.2 8 Claims



1. A hot-wire air-flow meter for measuring the flow rate of air flowing from an air cleaner into an internal combustion engine, comprising:
means for defining main air passage having a venturi portion, said main air passage means including a flow meter body made of one piece and a ring rigidly inserted in said flow meter body for forming said venturi portion;
a bypass air passage defined by said main air passage defining means so as to bypass said main air passage, said bypass air passage having an inlet port upstream of said venturi portion and an outlet port downstream of said venturi portion, said inlet port being a bore made in said flow meter body so as to open to said main air passage and said outlet port being opened to said main air passage and positioned so that the center of said outlet port is disposed at a position angularly distant 230°–310° from said inlet port;
thermosensitive means disposed in said bypass air passage for electrically detecting the flow rate of air flowing therein; and
a throttle valve turnably mounted on said main air passage defining means immediately downstream of said outlet port of said bypass passage by a valve shaft of said throttle valve so that a relative angular position of said valve shaft

to a line connecting the central axis of said inlet port of said bypass air passage and the central axis of said main air passage is at most 45.

4,624,135

FUEL INJECTION NOZZLES

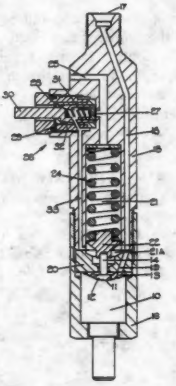
Michael R. Bungay; John W. Stevens; Richard M. Turner, all of Sudbury, and Richard J. Andrews, Guildford, all of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Dec. 14, 1984, Ser. No. 681,616

Claims priority, application United Kingdom, Jan. 31, 1984, 8402469

Int. Cl.[4] G01M *15/00*; F22G *7/14*; F02M *39/00*; B67D *5/08*

U.S. Cl. 73—119 A **5 Claims**



1. A fuel injection nozzle for supplying fuel to an internal combustion engine, comprising a valve member slidable within a bore, a seating defined at one end of the bore, the valve member being shaped at one end for cooperation with said seating, a walled chamber into which the other end of said valve member extends, a spring abutment carried on said other end of the valve member, a coiled compression spring located in said chamber and engaging said spring abutment to bias the valve member into contact with the seating, an outlet from said one end of the bore, a step defined on the valve member, passage means extending from a nozzle inlet and through which the pressure of fuel supplied to said inlet can act on said step to lift the valve member from the seating to allow fuel flow through said outlet, a periphery of said spring abutment having a working clearance with the wall of the chamber, a port communicating with a first portion of the chamber located on one side of the spring abutment which is remote from the valve member, passage means communicating with a second portion of the chamber located on another side of the spring abutment, a cylinder, a plunger slidable in said cylinder, said port being connected to one end of the cylinder and the passage means to the other end thereof, a spring biasing the plunger to said one end of the cylinder, said plunger being subjected to the pressure difference between said portions of the chamber when the valve member is lifted from its seating and being moved against the action of its spring, said plunger forming part of an electric switch means from which a signal can be obtained indicative of lifting of the valve member from its seating, and a drain extending from said chamber.

4,624,136

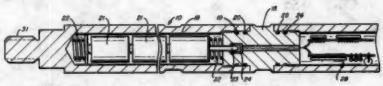
DOWN HOLE POWER CONVERSION MEANS FOR FULLY UTILIZING BATTERIES

Leroy C. Delatorre, Sugarland, and Homer M. Wilson, Houston, both of Tex., assignors to Panex Corporation, Sugarland, Tex.

Filed Mar. 29, 1985, Ser. No. 718,111

Int. Cl.[4] E21B *49/00*

U.S. Cl. 73—152 **5 Claims**



1. In a down hole, self-contained oil tool for use in a well bore where such tool utilizes D.C. batteries as a source of power,

housing means sized for passage through a well bore, said housing means carrying sensor means for sensing at least one down hole parameter and for providing electrical signals as a function of the parameter;

processing means in said housing coupled to said sensor means for processing said electrical signals where said processing means requires a defined amount of electrical operating current for a defined period of time at a defined regulated voltage level thereby defining a first power load relationship for a defined period of time,

D.C. battery means in said housing means comprised of a number of battery units, each having a defined voltage capacity at a defined electrical current and time life, and

power conversion means in said housing for coupling said battery means to said processing means and for converting electrical current at the voltage capacity of said battery means to electrical operating current at the regulated voltage level for operating said processing means, said battery units aggregatively having a voltage capacity, a defined electrical current and time life relationship which is substantially equal to the first power load relationship for a defined period of time so that the tool contains only the number of battery units required for supplying the first power load for the defined period of time.

4,624,137

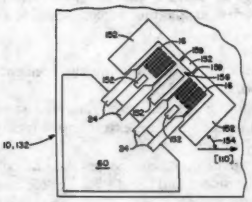
SEMICONDUCTOR DEVICE

Robert G. Johnson, Minnetonka, and Robert E. Higashi, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 481,095, Mar. 31, 1983, abandoned, which is a division of Ser. No. 310,345, Oct. 9, 1981, abandoned. This application Oct. 1, 1985, Ser. No. 782,197

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **90 Claims**



1. An integrated semiconductor device, comprising:

a semiconductor body having a depression formed by an anisotropic etch applied to a first surface of the body, the semiconductor body comprising (100) silicon having a (100) plane and a <110> direction, the first surface of the

semiconductor body being substantially parallel to the (100) plane; and

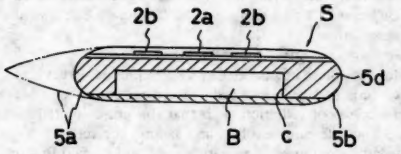
thin film dielectric member means comprising a static electric element, the member means having a predetermined configuration suspended over the depression, the predetermined configuration being oriented at a non-zero angle to the <110> direction, the member means being connected to the first surface at least at one location, the depression opening to the first surface around at least a portion of the predetermined configuration, the depression, the opening, and the member means providing substantial physical and thermal isolation between the element and the semiconductor body.

4,624,138

GAS FLOW SENSOR AND METHOD OF PRODUCING A GAS FLOW SENSOR

Hirofumi Ono; Kiyoharu Tsujimura; Masayuki Kamo, and Yoritaka Isoda, all of Kyoto, Japan, assignors to Stec, Inc., Kyoto, Japan

Filed Jun. 12, 1984, Ser. No. 620,074
Claims priority, application Japan, Jul. 4, 1983, 58-122196
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 **4 Claims**



1. A gas flowsensor for being disposed in a passage through which a gas is to flow in a predetermined direction, said sensor comprising:

a crystaline silicon substrate having a hollow portion and having an upstream end surface of streamlined shape so as suppress perturbations of the flow of gas in the passage, said substrate including a first crystalline silicon wafer having a first side and a second side opposite said first side and a second crystaline silicon wafer mated to said second side of said first wafer said hollow portion being located between said first and second wafers;

an upstream self-heating type resistor whose resistance increase with increasing temperature thereof, formed on said first side by said first wafer in a film by photolithography and etching directly over said hollow portion;

a downstream self-heating type resistor whose resistance increases with increasing temperature thereof, formed on said first side of said first wafer in a film by photolithography and etching, spaced downstream from said upstream heating resistor directly over said hollow portion;

protective films covering said upstream resistor and said downstream resistor so as to be exposed to the gas flowing through the passage when said sensor is disposed in said passage;

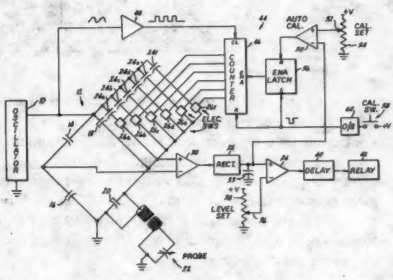
means for simultaneously applying an electrical current through said upstream resistor and said downstream resistor so as to heat said upstream resistor and said downstream resistor, whereby heat is provided from said upstream resistor and from said downstream resistor to the gas flowing through the passage in amounts proportional to the mass flow rate of the gas and inversely proportional to the temperature of the gas at the respective upstream and downstream resistors, the gas cooling said upstream resistor more that said downstream resistor, when said sensor is disposed in the passage; and means responsive to differences in voltage across said upstream resistor and said downstream resistor resulting from differences in temperature thereof produced by differential cooling thereof by the gas, for producing an electrical voltage corresponding to the mass gas flow in the passage.

4,624,139

CAPACITANCE-TYPE MATERIAL LEVEL INDICATOR

Robert C. Collins, Troy, Mich., assignor to Berwind Corporation, Philadelphia, Pa.

Filed Sep. 21, 1984, Ser. No. 652,855
Int. Cl.[4] G01F *23/26*; G01R *27/26*
U.S. Cl. 73—304 C **7 Claims**



1. A system for indicating level of material in a vessel as a function of material capacitance comprising: a source of rf power; bridge circuit means including first and second pairs of impedance means respectively connected in series across said source to form paired adjacent arms of said bridge circuit means, said second pair of impedance means including a capacitance probe adapted to be disposed in a vessel so as to be responsive to variations in capacitance as a function of material level and variable impedance means connected in series with said capacitance probe across said source; means connected across said bridge circuit means between the junction of said first pair of impedance means and the junction of said second pair of impedance means for indicating a balance condition of said bridge circuit means as a function of a voltage difference between said junctions; calibration circuit means including means for initiating a calibration mode of operation, means responsive to said initiating means and to said balance indicating means for automatically varying the impedance of said variable impedance means in said bridge circuit means independently of said capacitance probe during said calibration mode of operation, and means responsive to said balance indicating means during said calibration mode of operation for detecting said balance condition at said bridge circuit means, corresponding to a predetermined material level condition at said vessel, and for terminating said calibration mode of operation when said balance condition is obtained; and means coupled to said balance indicating means and responsive to variation said in balance condition at said bridge circuit means including said capacitance probe from said balance condition for indicating level of material in said vessel.

4,624,140

LIQUID MEDIUM CAPACITIVE DISPLACEMENT SENSOR

Jack A. Ekchian, Watertown; Robert W. Hoffman, Arlington, both of Mass., and Leon Ekchian, Woodland Hills, Calif., assignors to Optima Systems, Inc., Burlington, Mass.

Filed Jul. 30, 1984, Ser. No. 635,665
Int. Cl.[4] G01F *23/26*
U.S. Cl. 73—304 C **42 Claims**

1. A capacitive displacement sensor, comprising

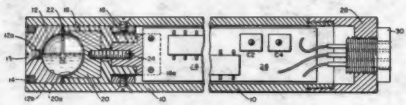
a vessel having a wall including at least two adjacent conductive wall segments,

means for electrically insulating said wall segments from each other,

a dielectric coating on the interior of at least one but not all of said wall segments, the interior of at least one conductive wall segment being exposed,

a conductive liquid-like medium contained inside said vessel covering a variable part of a least one wall segment with said dielectric coating and at least one wall segment without said dielectric coating, and

electronic means electrically connected to at least one wall



segment with said coating and at least one wall segment without said coating for producing an output related to the capacitance between said liquid-like medium and said one wall segment with said dielectric coating,

whereby displacement of said vessel causes relative movement between said vessel and said liquid-like medium and a concomitant detectable change in the capacitance between said liquid-like medium and the wall segment with the dielectric coating.

4,624,141

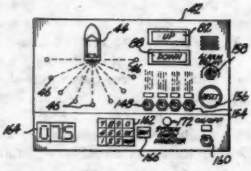
TOWROPE-HANDLING SYSTEM MONITOR FOR WATERSKIING

James R. Soleau, P.O. Box 33222, Seattle, Wash. 98133

Filed Apr. 2, 1985, Ser. No. 719,074

Int. Cl.[4] B63B *45/04*

U.S. Cl. 73—865.8 **23 Claims**



1. A device for monitoring the status of a water-skier being towed by a rope from a boat, comprising:

warning means mounted on the boat;

tow handle means attached to said rope, said tow handle means including actuation means gripped by said skier and responsible to release of the grip of the skier to produce a warning signal;

first transmission means linking said actuation means to said warning means to transmit said warning signal from said actuation means to said warning means, said warning signal being independent of the tension on said rope, said first transmission means including at least one electrical conductor running the length of said towrope from said tow handle to said boat; and

a continuous sleeve of flexible, waterproof material running the length of said towrope, said electrical conductor being surrounded by said sleeve.

4,624,142

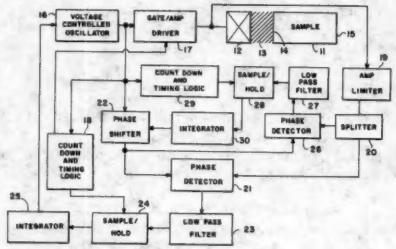
DOUBLE REFERENCE PULSED PHASE LOCKED LOOP

Joseph S. Heyman, Williamsburg, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 7, 1985, Ser. No. 709,257

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—597 **12 Claims**



1. Method for measuring the phase shift of continuous wave radiation between a first surface and a second surface comprising the steps of:

generating an electrical continuous wave;

producing pulses of said electrical continuous wave;

converting said pulses of said electrical continuous wave into pulses of radiation such that the pulses of radiation will emanate into said first and second surfaces;

converting the pulses of radiation reflected by said first and second surfaces into reflected electrical pulses;

phase shifting said generated electrical continuous wave to force it into phase quadrature with the reflected electrical pulses resulting from the reflection from said second surface; and

varying the frequency of said generated electrical continuous wave to force the phase shifted electrical wave into phase quadrature with the reflected electrical pulses resulting from the reflection from said first surface whereby the phase shift between said first and second surfaces can be determined.

4,624,143

ULTRASONIC REFLEX TRANSMISSION IMAGING METHOD AND APPARATUS WITH EXTERNAL REFLECTOR

Philip S. Green, Atherton, Calif., assignor to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 715,199, Mar. 22, 1985. This application Jul. 15, 1985, Ser. No. 755,287

Int. Cl.[4] G01N *29/00*

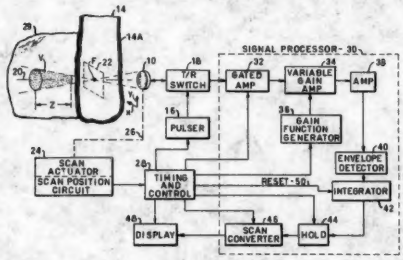
U.S. Cl. 73—620 **17 Claims**

1. In an ultrasonic imaging method for imaging the interior of objects such as body parts, the steps comprising

acoustically coupling reflecting means having scatterers therein to an object,

transmitting an ultrasonic beam through a portion of the object into said reflecting means and receiving echos reflected from scatterers within said reflecting means, and

processing echos received from a range zone within said reflecting means to form data for a display of a portion of



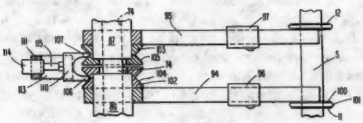
the interior of the object through which received echo signals pass.

4,624,144

FOR TESTING MACHINES, IMPROVEMENTS IN DETERMINING RUPTURE POINT AND SETTING GAUGE LENGTH

Robert S. Strimel, Penllyn, Pa., assignor to Tinius Olsen Testing Machine Co., Willow Grove, Pa.

Filed May 23, 1984, Ser. No. 613,359
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—834 **5 Claims**



5. In a testing machine having an extensometer including a pair of strain followers, improved means for setting the gauge length of the strain followers:

a pair of gauge followers respectively connected to the strain followers and each gauge follower having an exterior concave groove;

a pair of gauge cams; and

means supporting the gauge cams a fixed distance apart and for a reciprocating motion toward and away from the gauge followers to respectively engage with and to disengage from the exterior concave grooves, the engagements being for use in establishing the gauge length of the strain followers.

4,624,145

RACK AND PINION REACTION FORCE SENSOR

Robert E. Weber; Russell J. Wakeman, both of Newport News, Va., and Barry J. Driscoll, Fort Wayne, Ind., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 26, 1985, Ser. No. 716,288
Int. Cl.[4] G01L *3/14*
U.S. Cl. 73—861.31 **9 Claims**

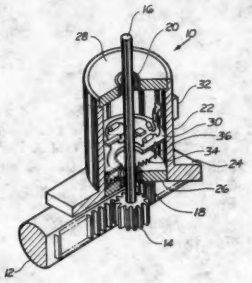
1. A rack and pinion reaction force sensor for sensing the force applied to the rack by the pinion mounted at the end of a shaft means, said sensor comprising:

a housing encircling a portion of the shaft means, said housing having at least one bearing mounted on the shaft means and rotatable thereby;

a bearing support means surrounding said bearing and located adjacent the pinion;

sensing element means located on said bearing support means and responsive to the reaction force on the shaft due to the force applied to the rack by the pinion; and

electronic circuit means mounted in said housing, electrically connected to said sensing element means and opera-



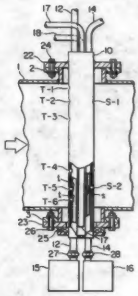
ble to generate an electrical signal proportional to the reaction force.

4,624,146

FLOW RATE MEASUREMENT APPARATUS

Yuzuru Nakagawa, Yachiyo, Japan, assignor to Onoda Cement Company, Ltd., Onoda, Japan

Filed Mar. 4, 1985, Ser. No. 707,688
Int. Cl.[4] G01F *1/46*
U.S. Cl. 73—861.66 **4 Claims**



1. An apparatus for measuring fluid flow of a fluid containing solid particles, comprising:

a fluid flow measurement unit disposed extending parallel to a radial cross sectional section of a main duct,

a plurality of pressure measurement ports provided on said fluid flow measurement unit to face an upstream direction at the centers of a number of annular areas equally dividing the area of said radial cross section of the main duct,

hydrostatic pressure ports provided to face in a downstream direction at positions dividing the area of said cross section of the main duct into equal areas,

a total pressure measurement conduit vertically disposed within the fluid flow measurement unit and having measurement ports communicated with said pressure measurement ports respectively,

a hydrostatic pressure measurement conduit vertically provided within said fluid flow measurement unit and having measurement ports communicated with said hydrostatic pressure measurement ports,

means isolating the interior of said measurement unit from the interior of said total pressure conduit, from the interior of said hydrostatic measurement conduit and from the exterior of said measurement unit,

means for introducing and withdrawing a coolant into said isolated interior of said measurement unit for cooling said

total pressure conduit and said hydrostatic measurement conduit, and

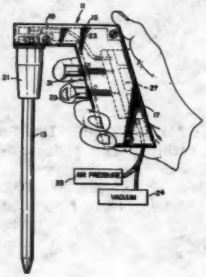
means for removing solid particles from said total pressure conduit and said hydrostatic measurement conduit by gravity to the exterior of said measurement unit.

4,624,147

PIPET GUN FOR DRAWING LIQUID INTO AND EXPELLING IT FROM A PIPET

James W. Kenney, West Chester, Pa., assignor to Drummond Scientific Company, Broomall, Pa.

Filed Nov. 12, 1985, Ser. No. 797,217
Int. Cl.[4] B01L *3/02*
U.S. Cl. 73—864.15 5 Claims



1. A pipet gun for drawing liquid into and expelling it from a pipet, comprising

a housing including a hand grip portion and a barrel portion,

a pipet-supporting portion connected to the barrel portion,

conduit means in the housing adapted to connect an air pressure source and a vacuum source to the pipet-supporting portion,

valve means carried by the hand grip portion in operative engagement with the conduit means and operable to selectively establish, and cut off, communication between the pipet-supporting portion, air pressure source, and vacuum source,

said valve means including

a valve body with a molded plastic back portion and a molded plastic front portion,

a gasket positioned between the back and front portions,

and means connecting together the back and front portions and the gasket,

said valve body back portion having an output channel molded in the front face of the valve body back portion for connecting air or vacuum to the conduit means connecting with the pipet-supporting portion,

said valve body front portion having

an air valve post extending horizontally therefrom,

a vacuum valve post extending horizontally therefrom, and

a hose connector post extending horizontally therefrom to connect with a hose that extends to the pipet-supporting portion,

an air input channel formed in the back of the valve body front portion and adapted to conduct air to the bore of the air valve post, and

a vacuum input channel formed in the back of the valve body front portion and adapted to conduct vacuum to the bore of the vacuum valve post,

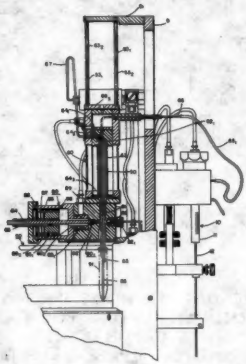
said hose connector post having a bore adapted to conduct air or vacuum to the hose extending to the pipet-supporting portion.

4,624,148

AUTOMATIC FLUID INJECTOR

Julius P. Averette, Baker, La., assignor to Dynatech Precision Sampling Corporation, Baton Rouge, La.

Filed Sep. 20, 1985, Ser. No. 778,194
Int. Cl.[4] G01N *35/06*
U.S. Cl. 73—864.21 10 Claims



1. In a fluid injector useful for the measurement and injection of preselected quantities of a fluid specimen into a medium such as an inlet to an analytical instrument wherein there is included the combination of (A) a syringe inclusive of a barrel into which a fluid specimen can be loaded, a needle mounted on an end of the barrel, and means for the displacement of the fluid specimen from said barrel via the dispensing end of the needle into said inlet, (B) an injector feed assembly comprises of a probe sub-assembly inclusive of a pair of concentrically mounted hollow needles for the pick up of said fluid specimen for filling the barrel of said syringe, and (C) a magazine for transporting one or more fluid specimen-containing septum sealed vials for pick up of fluid from a vial by the pairof hollow needles of said probe sub-assembly of said injector feed assembly for delivery to the barrel of said syringe via thrust of the hollow needles of said probe sub-assembly through the septem of a vial on pressurizing the contents of said vial by delivery of gas from a source through an annulus between the exterior surface of said inner hollow needle and the interior surface of said outer hollow needle of the pair of concentrically mounted hollow needles of said probe sub-assembly to produce flow of fluid specimen from said vial through the probe sub-assembly to the barrel of the syringe,

the improvement wherein the pair of concentrically mounted hollow needles of said probe sub-assembly of the injector feed assembly (B) is comprised of the combination of

(i) an outer rigid tubular needle of relatively large inside diameter, an end of which is directly affixed to said injector feed assembly, and

(ii) an inner flexible tubular needle, a terminal end and at least an adjacent portion thereof of which is contained within the bore of said outer rigid tubular needle and is of sufficiently small outside diameter to form an annulus between the external surface of said inner flexible tubular needle and the internal surface of said outer rigid tubular needle, while the opposite end of said inner flexible tubular needle is communicated with the barrel of said syringe,

whereby the outer rigid tubular needle protects the inner flexible needle when the pair of concentrically mounted hollow needles of the probe sub-assembly is thrust through the septum of a fluid specimen containing vial delivered by the magazine, and the inner flexible tubular needle can thereafter be thrust outside said outer rigid

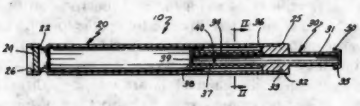
tubular needle and extended to the very bottom of a fluid specimen-containing vial such that on pressurization of the contents of the vial with a gas delivered via the annulus of the pair of concentrically mounted hollow needles of the probe sub-assembly essentially all of the fluid specimen can be removed from a vial, picked up by the probe sub-assembly, delivered to the barrel of the syringe, and injected into a medium via the dispensing end of the needle of the syringe.

4,624,149

SAMPLING TUBE

Dennis A. Lawrenz, Bridgman, and Ken A. Rinkenberg, Stevensville, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Feb. 19, 1985, Ser. No. 702,683
Int. Cl.[4] G01N *1/12, 1/14*
U.S. Cl. 73—864.52 **17 Claims**



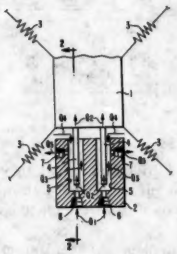
1. A molten metal immersion sampling device comprising:
an evacuated cylindrical metallic tube sealably enclosed at one end and having a sample receiving opposite end sealed by a fusible material, a frangible liner positioned within said tube in coaxial relationship therewith and spaced inwardly from said opposite end of said tube, said liner extending along at least a portion of the interior of said tube and having one end for receiving a molten sample and an opposite end enclosed to prevent escape of molten metal therethrough, said liner defining a pin sample mold for allowing easy removal of a pin sample from said metal tube, said metal tube conducting heat away from said one end of said liner to solidify the molten sample adjacent said one end of said liner to form a seal to prevent the loss of diffusible gases from said tube upon removal of said tube from the molten metal bath.

4,624,150

SAMPLING PIPE MEANS FOR CONNECTION TO A FLUID ANALYZER

Sumio Shimizu, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Jun. 25, 1985, Ser. No. 748,465
Claims priority, application Japan, Jun. 26, 1984, 59-132224
Int. Cl.[4] G01N *35/00*
U.S. Cl. 73—864.81 **4 Claims**



1. A sampling pipe means for connection to a fluid analyzer mounted in a substantially vibration free condition and having at least one fluid introducing pipe extending therefrom, said means comprising:
a pipe connecting block having a number of recesses therein corresponding to the number of fluid introducing pipes on the analyzer, each recess having a diameter larger than the outside diameter of the corresponding fluid introducing pipe and having a sampled fluid introducing opening therein for introducing the sampled fluid into said recess, said pipe connecting block being in a fixed position relative to said analyzer with a fluid introducing pipe in each recess in non-contact relationship to the inside wall of the recess and said pipe connecting block further having a bypass outlet opening out of each of said recesses between the free end of the fluid introducing pipe and the mouth of the recess for withdrawing fluid from said recess in excess of that taken into the analyzer through the fluid introducing pipe.

4,624,151

DEVICE FOR FIXING AN ACCESSORY ON A CYCLE

Gérard Huret, Nanterre, France, assignor to Huret et ses Fils, Nanterre, France

Filed Jun. 26, 1984, Ser. No. 624,711
Claims priority, application France, Jul. 1, 1983, 83 11018
Int. Cl.[4] G05G *1/04, 7/00*
U.S. Cl. 74—491 **10 Claims**

1. A deviee for mounting an accessory on a part of a cycle, said accessory being subjected to a force exerted by another component part of said cycle in operation, said device comprising a support on which said accessory is movably mounted, one of said support and said part of the cycle comprising a male part and another of said support and said part of the cycle comprising a female part, said male part and said female part being so shaped and adapted to be interengaged for said mounting with a wedging action therebetween in a given direction relative to said cycle for said interengagement, and means for maintaining said support in position such that said male and female parts are maintained interengaged, said means comprising an arrangement in which said force to which said accessory is subjected in operation is exerted substantially in said given direction.

4,624,152

CLUTCH ACTIVATING DEVICE

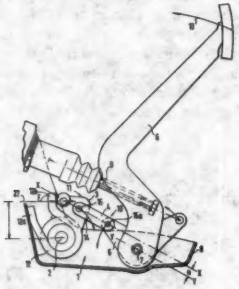
Erich Stotz, Rommelshausen, and Reinhard Horn, Wietnsheim, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F., Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 733,787
Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417814
Int. Cl.[4] G05G *1/04*
U.S. Cl. 74—518 **8 Claims**

1. A clutch activating device for vehicles having a clutch pedal which is pivotably mounted to a support structure, comprising:
a pivotable control lever acted upon by a compression spring,
a first lever joint formed by the control lever and an intermediate lever, and

a second lever joint formed by the intermediate lever and an activating lever of the pedal,

wherein an effective lever arm is defined by a perpendicular distance between a line of force extending through the first and second lever joints and a pivot axis of the clutch pedal,



wherein spring characteristics of the compression spring are selected and the lever joints are configured such that an activating force of the pedal is reduced in a first portion of a pivotable activating movement, and such that the force is further reduced in a second portion of said movement, and such that the activating force in said second portion is at least initially substantially constant.

4,624,153

CONTINUOUSLY VARIABLE TRANSMISSION

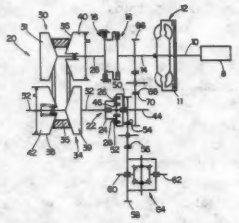
Hiroshi Itoh, and Mituhiko Okada, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 13, 1983, Ser. No. 561,066

Claims priority, application Japan, Dec. 13, 1982, 57-218150

Int. Cl.[4] F16H *37/08, 37/00*

U.S. Cl. 74—689 **16 Claims**



1. A continuously variable transmission for transmitting a torque from an engine to a final reduction gear, comprising:

an input shaft connected with the engine at one end thereof;

a continuously variable transmission means having a driving pulley with a fixed member and a movable member, the movable member being actuated by an hydraulic cylinder to form a V-shaped opening between the fixed member and movable member, a driven pulley with another fixed member and another movable member, said another movable member being similarly actuated by another hydraulic cylinder to form another V-shaped opening between said another fixed member and said another movable member, and a belt member spanning the pulleys providing for a continuously variable transmission ratio;

a planetary gear unit including a sun gear, a plurality of pinion gears which mesh with the sun gear and are connected with the driven pulley and a ring gear which meshes with said plurality of pinion gears;

a rotation transmitting means for transmitting rotation of the input shaft to the planetary gear unit, said rotation transmitting means being provided between the input shaft and the planetary gear unit and including a shaft connected with the sun gear of said planetary gear unit and a first gear connected with the input shaft, the first gear being located between the engine and the continuously variable transmission means;

a clutch means for engaging or disengaging the first gear with the driving pulley, said clutch means positioned between the first gear and the driving pulley;

brake means provided between the clutch means and the driving pulley, said brake means for stopping the rotation of the continuously variable transmission means;

a connection means, one side of which is connected with the ring gear of said planetary gear unit; and

a differential gear means connected with another side of said connection means, said differential gear means having an output shaft, whereby when said clutch means engages the input shaft with the driving pulley, the rotation of the input shaft is transmitted through two paths to said planetary gear unit, so that the transmission ratio range of said continuously variable transmission means is enlarged and the output shaft is driven in a forward rotational direction, and when said brake means stops the rotation of the continuously variable transmission means, the rotation of the input shaft is transmitted through only one path to said planetary gear unit, so that the transmission ratio range of said continuously variable transmission is fixed and the output shaft is driven in a reverse rotational direction.

4,624,154

DRIVE UNIT FOR MOTOR VEHICLE

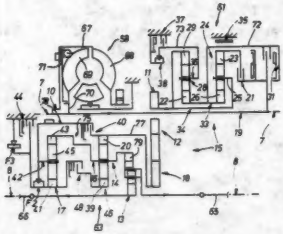
Karl-Friedrich Kraft, Esslingen, and Hans Merkle, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,640

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248350

Int. Cl.[4] F16H *37/08, 37/06*

U.S. Cl. 74—695 **37 Claims**



1. A five-speed drive unit for motor vehicles comprising:

first and second planetary gear transmissions disposed on an input shaft axis of rotation aligned with a main shaft of said drive unit,

third and fourth planetary gear transmissions disposed on an output shaft axis of rotation aligned with a differential gear system, and

a first clutch means,

wherein said third and fourth planetary gear transmissions are detachably coupled by said first clutch means for accommodating shifting into fifth gear.

4,624,155

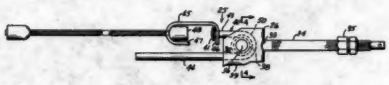
TENSION LIMITER FOR LINKAGES

George S. Wing, Palos Verdes Estates, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Continuation of Ser. No. 552,848, Nov. 16, 1983, abandoned, which is a continuation of Ser. No. 353,392, Mar. 1, 1982, abandoned, which is a continuation of Ser. No. 182,579, Aug. 29, 1980, abandoned, which is a continuation of Ser. No. 913,967, Jun. 9, 1978, abandoned. This application Jun. 21, 1985, Ser. No. 747,686

Int. Cl.[4] F16C *1/00*

U.S. Cl. 74—501 R 5 Claims



1. A tension limiter adapted to be placed in tension in a system which system has a first portion and a second portion that are placed in tension, said tension limiter forming a link in said system joining said portions and transmitting tensile forces between them, comprising:

a rigid body comprising a clevis

a pair of smooth deflector members carried by said rigid body which establish a bent path; and

a pre-bent stiffly bendable elongated rod having a smooth, continuous outer surface, a connection end, a free end, and a bend along its length which conforms to said bent path, said rod being in free and unclamped sliding contact with said deflector members, said rigid body and deflector members making only a said free and unclamped sliding contact with said rod, said rod being bent in a U-shape to form a bight and a pair of legs, a first of said deflector members being disposed inside the bight to retain the rod to the body, and the other of said deflector members bearing against the other of said legs, the two deflector members thereby maintaining the shape of the path, said first deflector member being a pin connected to the body across said clevis, and said second deflector member comprising a shoulder on said clevis,

one of said legs being adapted for connection to one of said portions of said linkage to receive tensile force;

said rigid body being adapted for connection to the other of said portions;

the dimensions of the bend and of the rod, and the properties of material of which the rod is made, including tensile strength and rigidity being established such that there is a predetermined datum value of tension load across said portions below which the rod cannot be pulled along said bent path with progressive yielding deformation in bending of successive regions of said rod as they move into and out of engagement with at least one of said deflector members, and above which said yielding deformation does occur until tension in the system is reduced to said predetermined datum value of tension load, whereby the maximum tension load in said system is limited to said datum value of tension load by the linkage tensioner acting as a yielding link, said datum value of tension load being substantially greater than the tension load which would overcome friction forces generated between said rod and said body and deflection members.

4,624,156

CRANKSHAFT ASSEMBLY

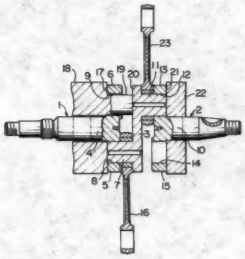
Yoshikiyo Kamata, Hachioji, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 741,825

Claims priority, application Japan, Jun. 20, 1984, 59-92039[U]

Int. Cl.[4] F16C *3/04*

U.S. Cl. 74—595 4 Claims



1. A crankshaft assembly and jig means for assembling said crankshaft assembly comprising:

a pair of crankshafts each including a crank arm, each crank arm extending in a direction normal to its respective crankshaft and formed with an opening for a crank pin to be force fitted and secured therein, and a crank web coextensive with each said crank arm and disposed diametrically opposite to its respective crank arm; and

an intermediate crank arm having opposing end portions and a crank pin at each end portion, each said crank pin being adapted to be force fitted and secured in a respective one of the openings formed in the crank arms of said pair of crankshafts;

wherein the improvement comprises;

each crank web of said pair of crankshafts having a through opening for receiving a columnar portion of said jig extending axially of the respective crankshafts for force fitting each said crank pin into a respective crank arm.

4,624,157

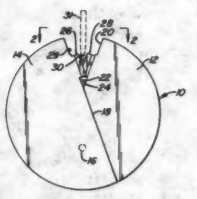
POCKET SHARPENER FOR KNIVES

Charles W. Forest, 33 Sleepy Hollow La., Orinda, Calif. 94563

Filed Dec. 12, 1985, Ser. No. 808,026

Int. Cl.[4] B21K *5/12*

U.S. Cl. 76—86 7 Claims



1. A unitary pocket sharpener comprising:

first and second discs each having a straight edge segment, said discs being overlapped and fixedly secured with said straight edge segments defining an open wedge-shaped gap;

first and second elongated rectangular teeth arranged on said straight edge segments such that said teeth cross forming a small wedge-shape gap of approximately 40°, wherein said teeth are fabricated of a hardened material and beveled at a cutting angle for stripping the edge of a tapered blade positioned in the small gap with the blade

edge against the crossed teeth when the blade is drawn across the teeth.

4,624,158

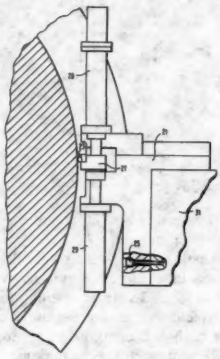
LATHE FOR MACHINING BALLOON-SHAPED POCKETS IN A WORKPIECE

Bobby R. Keller, Charlotte, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 13, 1985, Ser. No. 711,548

Int. Cl.[4] B23B *5/40*

U.S. Cl. 82—12 **9 Claims**



1. A lathe comprising:

means for rotating a workpiece about an axis;

a carriage which moves generally parallel to said axis;

a cross-slide disposed on said carriage;

a cross-feed disposed on said carriage;

a tool holder on said cross-slide;

a single-edge cutting tool in said tool holder;

a drive motor disposed on said cross-slide for moving said single-edge cutting tool in a circular arc while the cutting tool is cutting;

said drive motor having a drive shaft the axis of which is coincident with the axis of the circular arc and said drive motor being directly connected to said cutting tool eliminating lost motion between said drive motor and said cutting tool;

means for generally fixing said carriage at any position along said axis;

means for controlling the cross-slide; and

means for controlling the drive motor for moving the single-edge cutting tool in a circular arc, whereby pockets with a balloon-shaped interior having predetermined shapes and a very good surface finish can be machined in the workpiece.

4,624,159

LATHE ACCESSORY

Francis H. Kumer, and Hans J. Leiber, both of Tramelan, Switzerland, assignors to Kummer Freres SA, Fabriques de Machines, Tramelan, Switzerland

Filed Jul. 31, 1984, Ser. No. 636,360

Claims priority, application Switzerland, Aug. 8, 1983, 4306/83

Int. Cl.[4] B23B *3/26, 3/28*

U.S. Cl. 82—19 **8 Claims**

1. Accessory apparatus for a lathe having a work spindle lockable against rotation and an associated chuck for high-precision machining of the outer cylindrical surface and an adjoining shoulder of a work piece, said accessory apparatus comprising:

driving means;

a pedestal mounted on a cross slide;

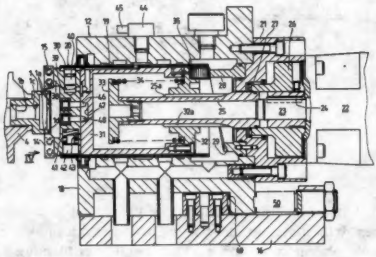
means for axially moving said cross slide toward and away from said work piece;

a housing slidably disposed in said pedestal, said housing having a bearing bore disposed therein;

means for sliding said housing in said pedestal;

a rotor and rotor jacket mounted for longitudinal displacement within said bearing bore of said housing, said rotor having a first end operatively connected to said driving means and an exposed end face at the other end thereof remote from said driving means;

slide plate means attached to said exposed end face of the rotor for holding two diametrically opposed tools capable of machining said work piece in two independent operations, said tools being radially shiftable, but axially immovable on said rotor;



means for radially shifting said tools on said rotor;

a fixed annular radical cam supported on said housing and disposed adjacent to said first end of said rotor for determining a pitch of said shoulder; and

a feeler roller mounted axially immovably on a portion of the rotor and disposed between said portion of the rotor and the radial cam, said feeler roller being held against the radial cam by a pressure spring juxtaposed between said portion of the rotor and a portion of said driving means, whereby upon rotation of the rotor the feeler roller follows the radial cam thereby longitudinally displacing the rotor to machine said outer cylindrical surface and adjoining shoulder of said work piece.

4,624,160

METHOD AND APPARATUS FOR TRIMMING THE LEADS OF ELECTRONIC COMPONENTS

Frank V. Linker, and Frank V. Linker, Jr., both of Broomall, Pa., assignors to American Tech Manufacturing, Inc., Glenolden, Pa.

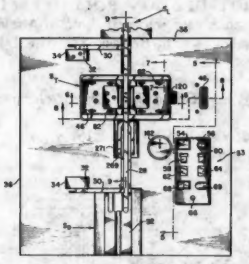
Division of Ser. No. 547,732, Oct. 31, 1983, Pat. No. 4,539,878. This application Jul. 29, 1985, Ser. No. 760,045

Int. Cl.[4] B23D *33/02, 15/04*

U.S. Cl. 83—13 **5 Claims**

1. A method for trimming leads of electronic devices having a body portion and a plurality of leads extending from the body portion in rows on opposite sides thereof consisting of the steps of passing devices through a channel defined by confronting edges of a pair of spaced shear plates, holding a device with the

rows confronting and adjacent the shear plates, applying a lead trimming force to shear leads to the inner confronting faces



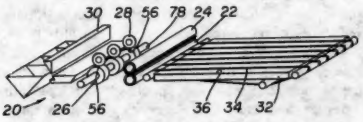
thereof to effect a cutting action from inboard of the channel outwardly toward the edges of the shear plates.

4,624,161

HIGH-SPEED CUTTING APPARATUS FOR CARD SHEETS

Julian Namowicz, 19175 Black Forest Dr., Waukesha, Wis. 53185, and John Gengler, 19512 Washington Ave., Union Grove, Wis. 53182

Filed May 20, 1985, Ser. No. 736,109
Int. Cl.[4] B26D *3/22*
U.S. Cl. 83—47 **16 Claims**



1. A method for accurate high-speed cutting of cards from sheets comprising:

holding one sheet, its leading edge in a first position;

on completing prior sheet cutting, positively engaging the one sheet between rollers to feed it in a first direction and releasing it after its leading edge reaches a second position;

starting before the releasing step, positively engaging the sheet between a plurality of pairs of rotation members having common tangent points at the second position, each pair having a unidirectional driving anvil roller and an idling slitter disk applying pressure on the anvil roller through the sheet;

advancing and simultaneously slitting the sheet a predetermined distance in the first direction by an indexing rotation of the anvil roller until the leading edge is twice the predetermined distance beyond the second position;

cutting the sheet across the slits along a line spaced from the second position by the predetermined distance; and

repeating the advancing and cutting steps until completing cutting of the sheet into cards.

4,624,162

APPARATUS FOR AUTOMATIC COIL FEED

Jerold W. Arnold, Shelbyville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 7, 1985, Ser. No. 784,945
Int. Cl.[4] B26F *1/40*; B26D *5/32*
U.S. Cl. 83—74 **9 Claims**

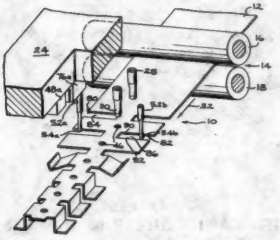
1. Apparatus for automatic coil feed of a sheet metal stock strip in progressive dies for punch press die operations comprising:

feed means for intermittently feeding a predetermined length of stock strip to said punch press die, said feed means normally operating at a preset feed length,

control means for said feed means for maintaining the correct feed length of the stock strip being intermittently fed into the punch press die, said control means operable to momentarily change the preset feed length of said feed means to supply a correcting length of stock strip to said punch press die,

two longitudinal arrays of registration openings in the stock strip,

first probe means operable when the stock strip stops to detect non-registration of a registration opening in one array resulting from overfeed of the stock strip,



second probe means operable when the stock strip stops to detect non-registration of an opening in the other array resulting from underfeed of the stock strip,

first and second switch means responsive to detection of non-registration by either the first and second probe means respectively, and

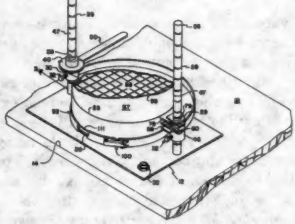
means responsive to the first switch means for activating the control means to shorten the length of stock strip fed to the punch press die and responsive to the second switch means for activating the control means to lengthen the length of stock strip fed to the punch press die while the press is in an operating mode.

4,624,163

ICE CREAM TUB CUTTER

Garland K. Grace, 5705 Criner Rd., Huntsville, Ala. 35802

Filed Sep. 16, 1985, Ser. No. 776,513
Int. Cl.[4] B26D *1/547, 3/16*
U.S. Cl. 83—411 R **5 Claims**



1. An ice cream tub cutter comprising:

(A) a turntable and vertical axle centrally coupled to an underside of said turntable and rotation means for rotating said turntable;

(B) clamping means for clamping a tub of ice cream to said turntable;

(C) first and second generally vertical posts generally positioned on opposite sides of said turntable;

(D) first and second vertically movable sleeves, said first sleeve being around said first post, and said second sleeve being around said second post, and locking means for locking a said sleeve to a said post at a selected position along a said post;

(E) cover cutting means vertically alignable with one of said sleeves for adjustable positioning against a said tub and for cutting a cover on a said tub at a selected elevation as said turntable is rotated;

(F) a wire connected between said sleeves and vertically alignable with the elevation of a cut made by said cover cutting means; and

(G) tension means for selectively tensioning said wire in an opening of said cover effected by said cover cutting means and causing said wire to cut through a said tub of ice cream at a selected vertical location.

4,624,164

HYDRAULIC SHEARING MACHINE

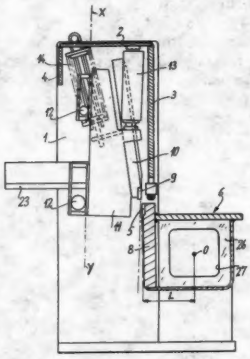
René Passa, Valmondois, France, assignor to Promecam Sisson-Lehmann, Saint-Denis, France

Filed Apr. 26, 1985, Ser. No. 727,608

Claims priority, application France, May 17, 1984, 84 07637

Int. Cl.⁴ B23D *15/08, 15/12*

U.S. Cl. 83—542 **2 Claims**



1. A hydraulic shearing machine comprising: a frame having first and second vertical end plates, an apron movably secured to said frame, an upper cutting blade secured to said movable apron, a hollow box having first and second ends rigidly secured to said first and second vertical end plates, respectively, and a lower cutting blade fixed to one of the side walls of said box, said upper and lower cutting blades being mounted in opposition to one another, and said hollow box being mounted for twisting movement about an axis parallel to and spaced a substantial distance from said lower cutting blade, whereby the vertically downward force exerted on said lower cutting blade during a cutting operation will cause said box to twist about said axis, this twisting producing a continuously varying horizontal displacement of said lower cutting blade which substantially cancels the opposed continuously varying horizontal displacement of said lower cutting blade caused by the horizontal forces exerted on said lower cutting blade during a cutting operation.

4,624,165

POWER TOOL, PARTICULARLY REVOLVING CUTTING PRESS WITH TOOL RECEIVING MEANS SUITABLE FOR A REMOTEDLY CONTROLLED EXCHANGE

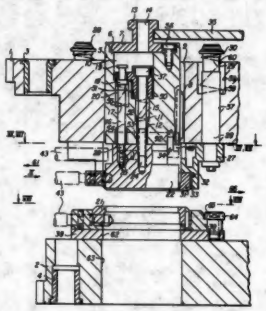
Walter Bredow, and Albert Schwarze, both of Alfeld, Fed. Rep. of Germany, assignors to C. Behrens AG, Alfeld, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,918

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335329

Int. Cl.⁴ B26D *7/26;* **B26F** *1/14*

U.S. Cl. 83—685 **19 Claims**



1. A power tool for working plate-shaped workpieces, particularly a revolving cutting press, comprising revolving plates arrestable in predetermined positions and receiving a plurality of tool sets each including at least one punch, stripper, and matrix; a plurality of receiving devices, said plurality of receiving devices including receiving device arranged to receive the matrix and being open in direction of withdrawl and insertion of the stripper and the matrix, respectively, said plurality of receiving deivces also including a receiving device arranged to receive the punch and being open in direction of withdrawal and insertion of the punch, said plurality of receiving devices being formed so that the punch, the stripper, and the matrix are directly withdrawable from and insertable into device arranged rectilinearily in a lateral direction which defines said withdrawal and insertion direction; a plurality of locking elements arranged to hold the punch, the stripper and the matrix in said receiving devices respectively, and actuatable independently of one another; and a plurality of individually switchable motor-driven actuating devices for releasing and arresting said locking elements of the punch, the stripper and the matrix respectively, and arranged near said revolving plates, the receiving device for the punch being formed as a punch holder, and the receiving device for the stripper being formed as a stripper shoe.

4,624,166

KITCHEN SLICER HAVING AN ADJUSTABLE KNIFE

Julius Kreth, Pfungstadt; Alfons Schreiber, Ebenweiler, and Willi Steinko, Nassau, all of Fed. Rep. of Germany, assignors to Mike & Kremmel Limited, Kowloon, Hong Kong

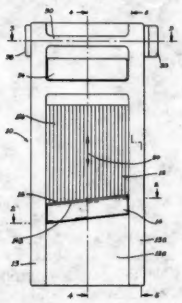
Filed Oct. 18, 1985, Ser. No. 788,918

Int. Cl.⁴ B26D *1/02*

U.S. Cl. 83—699 **3 Claims**

1. A kitchen or domestic food slicer, comprising a substantially flat bed surface over which a food item to be sliced is manually reciprocable; a knife traversing the bed surface in an opening therein and pivotable about an axis substantially to said direction of reciprocation, the knife having a sharp leading edge; a sliding bar positioned at either side of the bed surface, the bars having inclined cam surfaces engaging opposite ends of the knife, and being moveable longitudinally to vary the angle of the knife in the opening and therefore to raise or lower

the sharp leading edge of the knife relative to the surface so as to alter the thickness of a slice severed from the food item; and



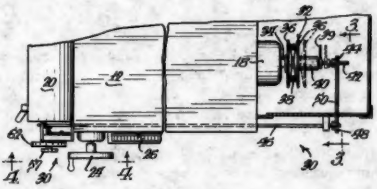
means for positioning the bars to set the knife to cut a preselected slice thickness.

4,624,167

BLADE SPEED CONTROL FOR A BAND SAW

Joseph M. Stefanic, Oak Park, Ill., assignor to Armstrong-Blum Mfg. Co., Chicago, Ill.

Filed Sep. 7, 1982, Ser. No. 415,292
Int. Cl.[4] F16H *55/52*; B26D *1/46*
U.S. Cl. 83—802 **3 Claims**



1. In a band saw having a frame, a front portion, an endless saw blade mounted on band wheels carried on said frame, a motor for driving said saw blade operably associated with said band saw, and a mechanically infinitely variable speed drive for said saw blade which includes a drive pulley having a pair of axially movable sheaves and mounted on the drive shaft of said motor, an adjustable speed control system for said saw blade comprising:

a control shaft rotatably mounted on said frame in spaced parallel relationship with said motor drive shaft;

coupling means operably connecting said control shaft to said ddrive pulley whereby rotation of said control shaft changes the axial spacing between said sheaves;

adjustment means on said control shaft at said front portion for manually rotating said control shaft;

said adjustment means comprising a first miter gear rigidly mounted on said control shaft, a second miter gear meshed with said first miter gear and carried on a stub shaft mounted from said band saw front portion, and a hand grippable member on said stub shaft for rotating said stub shaft and miter gears; and

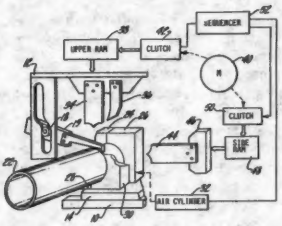
a blade speed indicator dial rotatable on said stub shaft and a gear train operably connected between said stub and indicator dial.

4,624,168

APPARATUS FOR CUTTING HEAVY WALL TUBE

John J. Borzym, Birmingham, Mich., assignor to Alpha Industries, Inc., Novi, Mich.

Division of Ser. No. 422,233, Sep. 23, 1982, Pat. No. 4,457,200.
This application Mar. 8, 1984, Ser. No. 587,514
The portion of the term of this patent subsequent to Dec. 25, 2002, has been disclaimed.
Int. Cl.[4] B23D *21/00*
U.S. Cl. 83—862 **6 Claims**



1. Apparatus for cutting tubing comprising:

a first ram having a continuously driven first stroke path of such length to extend fully through a tubing section,

a section ram having a continuously driven second path of such length to extend fully through a tubing section which is aligned with and angularly spaced from the first stroke path by about 90',

a first blade operated by the first ram and of sufficient length as to penetrate entirely through both opposite walls of the tubing along the first path but of a width which is less than the maximum inside dimension of the tubing measured across the path,

a second blade operated by the second ram to cut through the wall portions of the tubing which are uncut as a result of the first ram operation, and

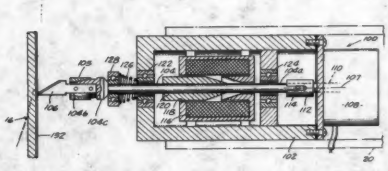
control means for operating said first ram through a cut and return stroke before operating said second ram.

4,624,169

APPARATUS FOR AUTOMATED CUTTING OF THIN FILMS

Carl Nelson, Anaheim, Calif., assignor to Aerochem, Inc., Orange, Calif.

Filed Apr. 8, 1985, Ser. No. 720,989
Int. Cl.[4] B26D *3/08*
U.S. Cl. 83—881 **5 Claims**



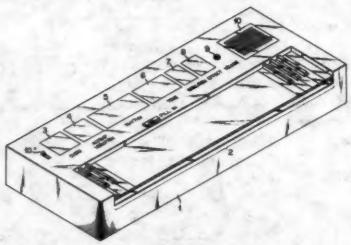
1. An improved apparatus for controllably cutting a thin film of maskant material covering a workpiece to be chemically milled, said apparatus including a holder for supporting a maskant cutter assembly, a first means for moving said holder in a first direction relative to the workpiece, a second means for moving said holder in a second direction relative to the workpiece, a third means for moving said holder in a first direction relative to the workpiece, and a supporting means for supporting the workpiece in close proximity with said holder, the improvement comprising a maskant cutter assembly comprising:

(a) a support frame;
(b) an electromagnetic element carried by said support frame;
(c) an electromagnetically energized member carried by said frame and adapted for rotation about its longitudinal axis, said member having first and second ends and a central armature portion disposed at least partially within said electromagnetic element, said member being reciprocally movable relative to said frame between a first position and a second position upon energization of said electromagnetic element;
(d) biasing means associated with said electromagnetically energized member for yieldably resisting movement thereof from between said first and second positions;
(e) a maskant cutter blade removably connected to said second end of said electromagnetically energized member;
(f) an electric motor means carried by said frame and operably associated with said electromagnetically energized member for controllably rotating said electromagnetically energized member about its longitudinal axis; and
(g) sensor means operably associated with said electromagnetic element and said cutter blade for sensing the amount of pressural contact between said cutter blade and said workpiece and for controllably energizing said electromagnetic element to continuously maintain a predetermined amount of pressural contact between said blade and said workpiece.

4,624,170
ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC ACCOMPANIMENT FUNCTION

Hiroko Ohno, and Naoaki Matsumoto, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 532,598, Sep. 15, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,641
Claims priority, application Japan, Sep. 22, 1982, 57-142547[U]
Int. Cl.[4] G10F *1/00*
U.S. Cl. 84—1.03 **9 Claims**

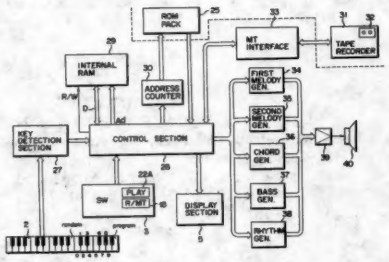


1. An electronic musical instrument, comprising:
means for manually selecting a desired one of different kinds of rhythms;
first means for storing a plurality of different automatic accompaniment pattern data;
means for manually selecting one of a plurality of automatic accompaniment patterns associated with the kind of rhythm selected by said rhythm selecting means;
second means for storing different preset tone color data for designating a tone color of automatic accompaniment tones to be produced in correspondence with each of said plurality of different automatic accompaniment pattern data stored in said first means;
means for reading out the selected automatic accompaniment pattern data and the preset tone color data stored in correspondence with said selected automatic accompaniment pattern data; and
means for producing tone signals for automatic accompaniment, said tone signals corresponding to the selected one of said plurality of different automatic accompaniment pattern data and the tone color data read out in correspondence with said selected automatic accompaniment pattern data.

4,624,171
AUTO-PLAYING APPARATUS

Keiji Yuzawa; Naoaki Matsumoto; Takehiko Kayahara; Naofumi Tateishi, all of Tokyo, and Makoto Fukuda, Sayama, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 597,168, Apr. 5, 1984. This application Jan. 23, 1986, Ser. No. 821,521
Claims priority, application Japan, Apr. 13, 1983, 58-63732
Int. Cl.[4] G10F *1/00*
U.S. Cl. 84—1.03 **9 Claims**



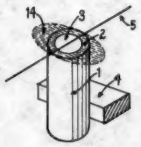
1. An auto-playing apparatus of the kind including a case containing electronic circuitry and having a setting section for receiving an external memory pack, comprising:
a memory pack adapted to be removably set in the setting section provided in the case of the apparatus for electrical coupling to the circuits in the case, said memory pack having music data on a plurality of music pieces in digital form, and respective musical number data corresponding to each of said plurality of music pieces;
a keyboard with keys corresponding to pitches of several octaves to enable execution of a manual play;
a switch for designating a manual play or an automatic play according to the music data stored in said memory pack. some of the keys in said keyboard, when said switch designating the automatic play, being set to operate as designating keys for selectively designating musical number data corresponding to the plurality of the music pieces which are stored in said memory pack;
a memory, coupled to said switch and said designating keys of said keyboard, for storing musical number data in response to operation of said designating keys in said keyboard when said switch designates the automatic play;
control means, coupled to said memory pack and said memory, for reading the music data in said memory pack corresponding to the musical number data in said memory and for outputting the music data; and
reproducing means, coupled to said control means, said keyboard and said switch, for reproducing, when said switch designates the manual play, the music corresponding to the keys of said keyboard, and for reproducing, when said switch designates the automatic play, the music in accordance with the music data outputted by said control means.

4,624,172

GUITAR PICKUP POLE PIECE

Glenn McDougall, Saskatoon, Saskatchewan, Canada

Filed May 29, 1985, Ser. No. 739,045
Int. Cl.[4] G10H *3/18*
U.S. Cl. 84—1.15 **18 Claims**



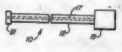
15. A pickup in combination with a vibration producing string of a stringed musical instrument, said pickup including a pole piece, said pole piece comprising a hollow cylinder of magnetizable material, means to magnetically energize said cylinder and a resistive field coil operatively connected to said hollow cylinder, said string passing diametrically over one open end of said hollow cylinder in operative relationship therewith.

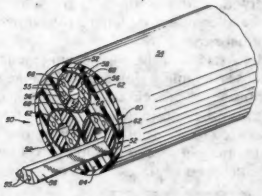
4,624,173

RAIL GUN BARREL ASSEMBLY

Richard L. Creedon, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Jun. 21, 1983, Ser. No. 506,430
Int. Cl.[4] F41F *1/02, 17/08*
U.S. Cl. 89—8 **1 Claim**





1. A rail gun barrel assembly defining an elongated bore, said barrel assembly comprising:

a pair of elongated, generally parallel conductive rails extending along opposite sides of said bore and being symmetrical about a longitudinal axis of said bore;

a pair of elongated insulating members disposed generally coextensively with said rails and circumferentially between them; said insulating members abutting said rails to define interfaces extending outward from said elongated bore;

a pressure medium disposed about said rails and said insulating members; and

a relatively stiff outer shell disposed about and containing said pressure medium, said shell being separated from said rails and insulating members by said pressure medium;

said pressure medium being pressurized so as to apply pressure radially inwardly on said rail and insulating members to preload said rails and insulating members, said rails and insulating members being compressively stressed by said pressure medium, said interfaces being thereby sealed against entry of high pressure gas from said bore during firing;

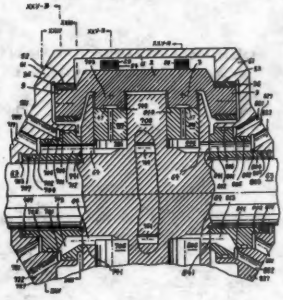
said pressure medium being in solid phase and being a material capable of being cured from liquid to solid phase so that the barrel may be manufactured by injecting the pressure medium as a liquid, pressurizing it, and curing it to solid phase.

4,624,174

MULTIPLE STROKE RADIAL PISTON MACHINE HAVING PLURAL BANKS OF CYLINDERS AND FLUID PRESSURE POCKETS ON THE PISTONS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 344,110, Jan. 29, 1982, abandoned, which is a division of Ser. No. 119,349, Feb. 7, 1980, abandoned. This application Apr. 17, 1984, Ser. No. 601,392
Int. Cl.[4] F01B *1/00*
U.S. Cl. 91—485 **22 Claims**



1. In a radial piston device in combination: a housing, a rotor rotatably mounted in said housing, working chambers in said rotor, pistons reciprocable in said working chambers and along wall faces of said working chambers, inlet channels and outlet channels communicated to said chambers and to said housing, a stroke guide provided in said housing and radially of said chambers and pistons for the guidance of the strokes of said pistons, stroke transfer bodies mounted between said pistons and said stroke guide, control means for the control of flow of fluid to and from said working chambers, and multiple inward and outward guide faces on said stroke guide to guide said reciprocable pistons a plurality of times inward and outward in said chambers along said wall faces at each revolution when said rotor revolves;

wherein fluid pressure pockets are provided in the direction of a lateral load of said pistons,

wherein said fluid pressure pockets are located between peripheral outer portions of said pistons and portions of said wall faces,

wherein said stroke transfer bodies are pivotably borne on bearing beds on said pistons to permit pivotion of said bodies around center axes which are normal to the axes of said pistons and parallel to the axis of said rotor,

wherein said stroke transfer bodies have ends with an ability to move along said outward and inward guide faces of said stroke guide, while said ends have portions with second axes parallel to said center axis but eccentrically distanced therefrom,

wherein said pivotion runs through angles of pivotion between pivot angle limitations which are formed by said bodies and said pistons,

wherein control portions are provided on said stroke trans-

fer bodies and wherein said control flow passages are provided on said pistons to control the flow of fluid,

wherein said control portions alternately open and close said passages in dependency on said angles of pivotion and thereby in timed relation to the movement of said stroke transfer bodies along said outward and inward guide faces of said stroke guide,

wherein said working chambers form at least two cylinder groups, while said pistons form piston groups in said cylinder groups;

wherein each cylinder of the first cylinder group is located axially of a respective cylinder of a second cylinder group, whereby each two cylinders of said two cylinder groups have radial axes in equal radial planes of said rotor, and,

wherein said transfer bodies extend through at least two cylinder groups to form common transfer bodies for at least two pistons in a respective plane of said equal radial planes,

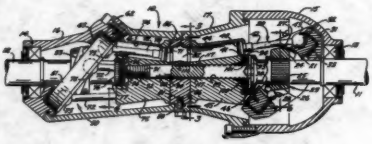
whereby said cylinders guide said pistons and said pistons guide said transfer bodies to maintain the location of the axes of the ends of said transfer bodies in equal radial planes through the axis of said rotor.

4,624,175

QUIET HYDRAULIC APPARATUS

Gunnar A. Wahlmark, 7636 Edgewood Rd., R.F.D. 3, Dixon, Ill. 61021

Filed Aug. 28, 1985, Ser. No. 770,097
Int. Cl.[4] F01B *13/04*; F04B *1/30*
U.S. Cl. 91—487 **11 Claims**



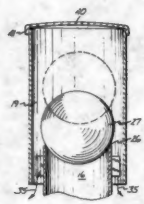
1. Hydraulic apparatus adapted to pressurize oil and comprising first and second rotatable swash plates, first and second rotatable cylinder blocks having opposing faces each formed with a set of angularly spaced cylinders, a first set of angularly spaced pistons connected to rotate with said first swash plate and said first cylinder block and supported to reciprocate in the cylinders of said first cylinder block, a second set of angularly spaced pistons connected to rotate with said second swash plate and said second cylinder block and supported to reciprocate in the cylinders of said second cylinder block, a rotationally stationary valve block disposed between and seated against opposing faces of said cylinder blocks for controlling the flow of oil to and from the cylinders of each cylinder block during rotation of the cylinder blocks, said cylinder blocks tending to move axially toward and away from said valve block as said oil is pressurized to a working pressure, a rod tying said cylinder blocks axially together and transmitting the axial movement of each cylinder block to the other cylinder block whereby a force tending to unseat one cylinder block from said valve block tends to seat the other cylinder block against said valve block, and pressure-actuated means comprising an annular diaphragm encircling said rod and made of resiliently yieldable material, said diaphragm having a groove defining a pressure chamber, means for admitting oil at working pressure into said pressure chamber, said diaphragm acting between said rod and one of said cylinder blocks and responsive to the pressure in said chamber to force said cylinder blocks toward said valve block when such pressure increases and to allow said cylinder blocks to move away from said valve block when such pressure decreases.

4,624,176

AIR VENT WITH FLOATING CLOSURE

Wayne Steinke, Hope, N. Dak. 58046

Filed Apr. 8, 1985, Ser. No. 720,683
Int. Cl.[4] F23J *13/00*
U.S. Cl. 98—119 **7 Claims**



1. An air vent designed to be located outside of a building and to be connected through a wall of the building to an air blower located within the building, said vent comprising:

a housing designed to be secured to a wall of a building in closely spaced relation thereto and with the housing disposed substantially vertically;

a cylindrical pipe designed to be connected to an air blower and extending into said housing and having a cross-sectional area less than the interior cross-sectional area of the housing, said pipe terminating at an upper open end in a flat circular surface perpendicular to the axis of the pipe;

a plurality of spaced radial ribs secured to the pipe and the lower portion of the housing for securing the pipe within the housing with the axis of the pipe generally parallel to the axis of the housing so that when the housing is mounted vertically the upper flat circular surface at the open upper end of the pipe will be disposed generally horizontally, said spaced ribs providing unobstructed passages therebetween for allowing air to pass downwardly therebetween;

a light weight member having a cross-sectional area at least as great as that of the pipe but less than the cross-sectional area of the housing so that when the housing is vertical the light weight member normally rests on the flat circular upper end of the pipe to close such upper end but is free to move upwardly due to the air pressure when the air blower is operated to allow the air to pass downwardly between the radial ribs;

a cover secured to said housing at the upper end of the housing, said cover having a downturned flange secured snugly to the housing to prevent the entry of rain or other foreign matter into the housing; and

bracket means secured to the vent for securing the housing to a wall of a building in spaced relation thereto with the housing substantially vertical.

4,624,177

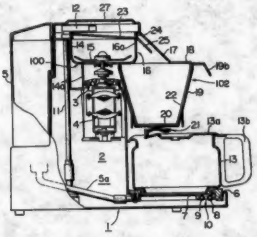
COMBINED COFFEE GRINDING AND BREWING MACHINE

Nobuo Ito, Kani, and Masashi Tajima, Kiryu, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 5, 1985, Ser. No. 741,554
Claims priority, application Japan, Jun. 12, 1984, 59-87260[U], Aug. 27, 1984, 59-130071[U]; Oct. 13, 1984, 59-154798[U]; Oct. 13, 1984, 59-154799[U]
Int. Cl.[4] A47J *31/42*
U.S. Cl. 99—286 **19 Claims**

1. In a combined coffee grinding and brewing machine including a motor-driven mill assembly having a mill housing for receiving coffee beans to be ground into grains, the mill housing having a grain filter for allowing the coffee grains to be driven out of the mill housing, a brewer assembly disposed under the grain filter of the mill assembly for receiving the

coffee grains therefrom, and a water heater for heating water preparatory to delivery to the brewer assembly, the improvement comprising a mill cap closing an open top of the mill housing and adapted to temporarily receive thereon the heated



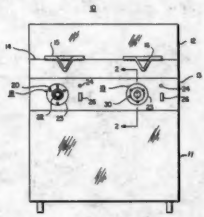
water from the water heater, and a water chute extending from the mill cap toward the brewer assembly for pouring the heated water onto the coffee grains contained in the brewer assembly, whereby coffee can be brewed without wetting the interior of the mill housing with the heated water.

4,624,178

PROTECTIVE COVER FOR TEMPERATURE CONTROL

Richard Keating, 330 Sutton Rd., Barrington Hills, Ill. 60010

Filed Oct. 2, 1985, Ser. No. 783,168
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—337 **3 Claims**



1. In combination with a deep fat fryer, or the like, including a cabinet having a front and housing a cooking vessel containing a quantity of cooking oil and means for heating the cooking oil to cooking temperature;

control means, mounted on the cabinet front, for setting the temperature of said cooking oil, said control means including a rotatable knob means for adjustment thereof;

protective cover means, comprising a metal shell having an annular ring portion, configured to enclose said rotatable knob means for preventing access thereto;

said control means including a plurality of circularly arranged screws having shanks and enlarged heads, the diameter of said ring portion being small enough to fit within a circle inscribing the shanks of said screws and large enough to be held in place by said enlarged heads; and

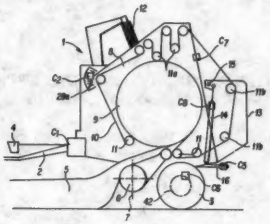
said protective cover means being maintained in position enclosing said control knob by the enlarged heads of said screws.

4,624,179

AUTOMATIC CONTROL DEVICE FOR TYING IN A HAY BALER

Drutel Yves, Meudon la Foret, and Joyez Gérard, Grisy Suisnes, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 23, 1984, Ser. No. 582,740
Claims priority, application France, Feb. 28, 1983, 83 03276
Int. Cl.[4] B65B *13/18*
U.S. Cl. 100—4 **9 Claims**



1. An automatic control device for tying a hay bale in a hay baler comprising:

a tie guiding arm having a first end which is driven back and forth over the width of said baler;

an electric motor connected to said arm for driving said first end;

means to drive bales in rotation;

a first sensor for sensing the speed of said means to drive;

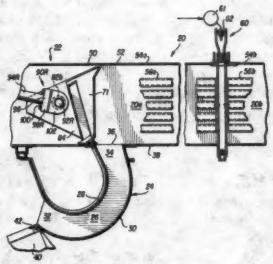
a microprocessor for receiving input signals from ssaid first sensor and for producing signals for controlling said electric motor so that said first end is stopped and held in position a determined number of times and for a determined period.

4,624,180

ELECTRONIC BALE DENSITY CONTROLLER

Richard P. Strosser, Akron, Pa., assignor to New Holland, Inc., New Holland, Pa.

Filed Sep. 6, 1985, Ser. No. 773,472
Int. Cl.[4] B30B *15/26*
U.S. Cl. 100—41 **29 Claims**



12. A method for controlling the density of bales of crop material discharged from a bale case of an agricultural baling machine, said method comprising the steps of:

introducing crop material into said bale case;

reciprocably driving a plunger assembly in a manner whereby said plunger means applies a compactive force to crop material introduced into said bale case and thereby facilitates movement of said crop material through said bale case;

providing resistance to the movement of crop material introduced into said bale case;

sensing the stress experienced by said plunger assembly including stress experienced during the application of said compactive force applied by said plunger assembly and for producing a signal in accordance with said sensed stress;

obtaining an indication of the quantity of crop material being introduced into said bale case; and,

controlling the degree of resistance to the movement of crop material introduced into said bale case in accordance with said indication of said crop introduction quantity and said signal.

4,624,181

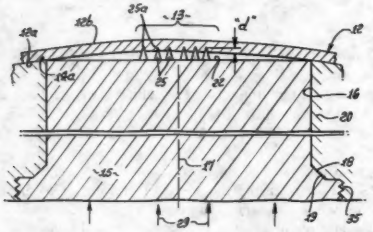
CAN IDENTIFICATION METHOD AND APPARATUS

James D. Anderson, 54 Hubbard Ave., San Fernando, Calif. 91340

Filed May 20, 1985, Ser. No. 736,105

Int. Cl.[4] B44B *5/02*

U.S. Cl. 101—4 **16 Claims**



1. The method of forming identification markings on a thin walled can having a bottom wall with outwardly concave shape, the steps that include

(a) providing a punch having a surface facing said wall and discrete projections separated from one another, and projecting from said surface,

(b) and displacing the punch relatively toward said can concave bottom wall to cause the projections to penetrate the wall to depths less than the wall thickness, thereby to form discrete and separate indentations in the can wall, the indentations defining at least one recognizable alphanumeric character, said indentations formed in a local region of the can bottom wall, which local region has an opposite side inside the can, and including maintaining said opposite side unsupported during said (a) and (b) steps, and also engaging the punch surface with said wall at locations about said projections, and during said formation of the indentations to control wall deflection and projections penetration into the wall.

4,624,182

DEVICE FOR DAMPENING A PRINTING PLATE

Dimitrios Pyliotis, Leimen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

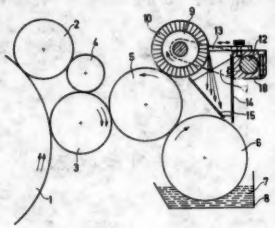
Filed Jul. 20, 1984, Ser. No. 633,121

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326699

Int. Cl.[4] B41L *25/04, 41/00*

U.S. Cl. 101—147 **3 Claims**

1. A device for dampening a printing plate of a rotary printing machine having in successive engagement a dampening-pan roller, a metering roller and dampening-medium applicator rollers for forming a very thin uniform dampening-medium film comprising at least one brush roller spaced from the dampening-pain roller and cooperatively engaging and rolling on the metering roller, said brush-roller having absorptive brushes on the periphery thereof engageable with the surface of the metering roller for removing at least part of the dampening



medium located in excessive quantities at any surface region of the metering roller.

4,624,183

INK METERING DEVICE

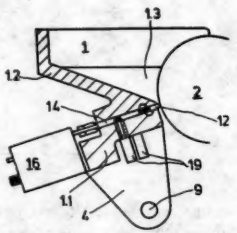
Fred Kunkel; Peter Hummel, both of Offenbach am Main; Bert Cappel; Günther Schniggenfittig, both of Mühlheim, and Helmut Kerber, Rödermark, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 760,304

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427909

Int. Cl.[4] B41F *31/04;* B41L *27/06*

U.S. Cl. 101—365 **15 Claims**



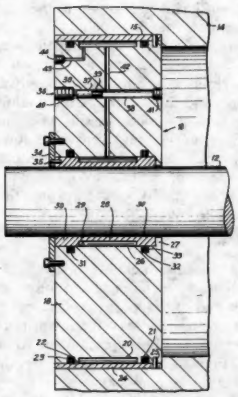
1. An ink metering device including a plurality of ink slides in the ink fountain of a printing press wherein the ink fountain is placed opposite the ink fountain roller, each ink slide having a metering element of duct width movable by an adjusting screw which is connected to an adjusting pin and biased by a spring element relative to the ink fountain to produce a metering gap opposite the ink fountain roller, each adjusting pin being mounted on the ink fountain without radial play but freely movable in the direction of its longitudinal axis, the spring element being supported between a fixed part on the ink fountain and the metering element, and a length-equalizing coupling permitting transmission of an adjusting movement to the adjusting pin and the metering element arranged so that its length-equalizing action is effective only by overcoming the force of the spring element.

4,624,184

ANNULAR EXPANSIBLE HEADS FOR A PRINTING CYLINDER ASSEMBLY

Sidney Katz, and Robert Katz, both of 78 W. 11th St., Apt. 22, New York, N.Y. 10011

Filed Mar. 27, 1984, Ser. No. 593,952
Int. Cl.[4] B41F *13/10*; B21B *31/32*; B23B *31/40*
U.S. Cl. 101—375 8 Claims



1. An annular head for the support of a printing cylinder, including:

a rigid and dimensionally stable annular body having internal and external peripheries and an axial length;

a first cylindrical expansion diaphram having an axial length less than or equal to the axial length of said annular body and extending axially of said external periphery of said annular body, said first diaphram and said annular body, in combination, defining a first expansion chamber at the external periphery of said body;

a second cylindrical expansion diaphram having an axial length less than or equal to the axial length of said annular body and extending axially of the internal periphery of the annular body, said second diaphragm and said annular body, in combination, defining a second expansion chamber at the internal periphery of said body;

at least one hydraulic actuator operatively connected to said first and second cylindrical expansion chambers; and,

hydraulic actuator means comprising said at least one hydraulic actuator for pressurizing said respective first and second expansion chambers, and for expanding said first cylindrical expansion diaphram radially outwardly of said annular body, and, for expanding said second cylindrical expansion diaphram radially inwardly of said annular body.

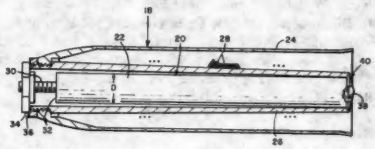
4,624,185

MISSILE BALLAST ASSEMBLY

John D. Emerson, Arab, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 5, 1985, Ser. No. 762,469
Int. Cl.[4] F41G *7/32*; F42B *15/04*
U.S. Cl. 102—293 3 Claims

1. In a wire guided missile having bobbin assembly means carried in the aft end of said missile for dispensing electrified guidance wire therefrom, a ballast assembly carried in said



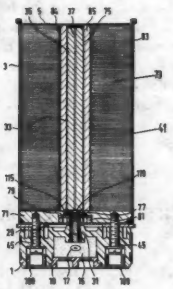
bobbin assembly means for varying the center of gravity of said missile.

4,624,186

INFRARED RADIATION-EMITTING DECOY PROJECTILE

Axel Widera, Ainring; Alois Schiessl, Bad Reichenhall-Marzoll; Walter Hanser, Bad Krozingen-Tunsel; Peter Rayer, and Klaus Hieke, both of Neuenburg, all of Fed. Rep. of Germany, assignors to Buck Chemisch-Technische Werke GmbH & Co., Bad Überkingen, Fed. Rep. of Germany

Filed Apr. 23, 1986, Ser. No. 854,770
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515166
Int. Cl.[4] F42B *4/26*
U.S. Cl. 102—336 9 Claims



1. In a decoy projectile which can be fired into the air and when ignited will emit infrared radiation so as to divert a missile with an infrared search head from its path of travel and away from a target, said projectile including a can-shaped casing having a side wall and a first end which is open; an electrically-activated contact head attached to said second end of said casing; a cover sealingly attached over said open first end of said casing; an igniter-destructor unit centrally positioned within said casing and operatively associated with said contact head, said igniter-destructor unit including an igniter-destructor capsule containing an igniter-destructor charge, and a layer of combustible flakes positioned between said igniter-destructor unit and said side wall of the casing,

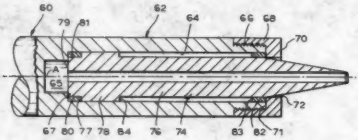
the improvement wherein said projectile includes an ignition-expediting material between said igniter-destructor unit and said side wall of said casing.

4,624,187

PENETRATOR PROJECTILES

Jürgen Bocker, Oberhausen; Klaus Gersbach, Willich, and Klaus W. Klein, Neuss, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 603,132, Jun. 23, 1984, Pat. No. 4,559,876.
This application Sep. 10, 1985, Ser. No. 774,338
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314752
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—520 2 Claims



1. A nose unit for a penetrator projectile having a high ratio of length to diameter and constructed to be at least transitionally variable in shape to improve the separation of discardable sabot segments after emerging from the barrel of a weapon, wherein

the nose unit is axially movably mounted in a central axial bore of said penetrator projectile;

said bore receiving said nose unit which has a frusto-conical front end, formed in such way, that in the initial position prior to firing of the projectile, the front end of said nose unit is in a retracted position in said bore;

said nose unit being moved forward out of said bore during firing acceleration such that said nose unit, on leaving said barrel projects forwardly in said bore of said projectile, the nose unit having a second central axial through-bore,

said bore of the projectile forming a guide for said nose;

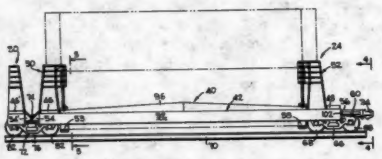
said nose unit being slidably mounted in said first bore so as to form a piston fitting the first bore; the rear end surface of said nose unit abuts in the initial position against an annular confronting surface of said first bore, a blind hole is disposed at the rear of the first central axial bore, after the projectile has left the barrel of the weapon airflow through said second central axial through bore of said nose unit causes pressure to build up in the blind hole to displace the nose unit in the direction of flight of the projectile.

4,624,188

STACK SUPPORTING CONTAINER CAR

Gary S. Kaleta, Warren, Oreg., assignor to Gunderson, Inc., Portland, Oreg.

Filed Aug. 14, 1984, Ser. No. 640,733
Int. Cl.[4] B61D *3/20*
U.S. Cl. 105—355 3 Claims



1. A stack supporting container railway car unit for selectively supporting upper and lower containers of the same length, or upper and lower containers with the upper container being longer than the lower container, each container having four upright corners defined by side and end walls, and also having top and bottom walls with the bottom of the lower container being spaced as close to the top of the railroad tracks as believed safe, comprising:

(a) first and second trucks having wheels adapted to be supported on railroad tracks;

(b) a first body bolster pivotally supported on said first truck;

(c) a second body bolster pivotally supported on said second truck;

(d) a pair of parallel side sills rigidly secured to said body bolsters, said body bolsters and said side sills defining an opening of sufficient size to permit the bottom of a lower container to pass therebetween;

(e) means defining corner supporting feet each including a generally horizontal container supporting surface and adapted to receive the corners of said lower container for solely supporting the weight of the containers and transmitting the weight to said side sills, said corner supporting feet including upstanding transverse surface means for assisting the side sills to restrain longitudinal and transverse movement of the lower container in said car unit;

(f) a first bulkhead rigidly secured to said first body bolster and to said side sills;

(g) a second bulkhead rigidly secured to at least said side sills;

(h) restraining means, included in each of said first and second bulkheads, including fixed longitudinal and transverse bulkhead walls positioned respectively on each bulkhead to restrain at least the lower portions of associated corners of the upper container, for maintaining an upper container in transport position upon a lower container within the railway car unit; and

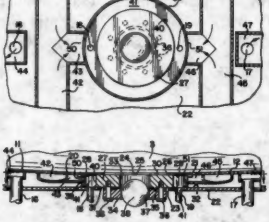
(i) a plurality of movable corner engaging mechanisms adapted to be moved to a container restraining position in which respective parts thereof extend transversely inward of respective ones of said longitudinal bulkhead walls to restrain longitudinal and lateral movement of the upper container when subjected to severe container dislodging forces, when both containers are of the same length, and said movable corner engaging mechanisms being adapted to be moved out of said container restraining position and said longitudinal and transverse bulkhead walls being effective to assist in restraining movement of the upper container while said corner supporting feet, assisted by said side sills and body bolsters, restain longitudinal and lateral movement of the lower containers when the upper container is longer than said lower container.

4,624,189

HEATED OUTLET VALVE FOR RAILWAY TANK CAR

Richard P. Loevinger, P.O. Box 68, Brandon, S. Dak. 57005

Filed Feb. 27, 1984, Ser. No. 583,648
Int. Cl.[4] B61D *27/00, 5/00;* F16K *49/00*
U.S. Cl. 105—451 3 Claims



1. In a lading tank of a railway tank car, said tank car having a bottom and a pair of heat elements sloped toward an outlet valve opening of said tank car and vertically spaced above said bottom and sealed to said tank car for forming an insulated dead air space between said heat elements and said bottom, and heated fluid medium heat ducts associated with said heat ele-

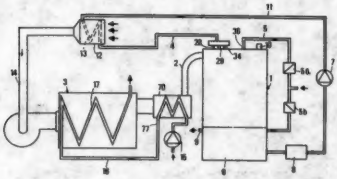
ments for heating said heat elements, said heat ducts having a heated fluid medium inlet and outlet, said heat elements defining a fluid flow means communicating with said outlet valve opening, said fluid flow means comprising an annular plate member concentrically disposed to said outlet valve opening and sealingly located between the bottom of the tank and said heat elements, and an annular flange concentrically disposed to said outlet valve opening and sealingly located completely between the bottom of the tank and said heat elements, said annular flange and said annular plate defining therebetween an annular heat chamber completely surrounding said annular flange, means connecting said heat ducts to the interior of said annular heat chamber, said fluid flow means being disposed in said insulated dead air space, said annular flange having a fluid flow opening communicating with said outlet valve opening, whereby the flow of the heated fluid medium through the heat chamber heats the annular flange which in turn transfers heat to the lading flowing out of the tank car outlet valve opening.

4,624,190

APPARATUS FOR THE DISPOSAL OF FLUE GAS FROM GAS OR LIQUID-FUEL BOILER-BURNER GROUPS

Silvano Cappi, Via Pescetti 15, Verona, Italy

Filed Feb. 7, 1985, Ser. No. 699,370
Claims priority, application Italy, Feb. 15, 1984, 84910 A/84
Int. Cl.[4] F23J *15/00*
U.S. Cl. 110—215 **2 Claims**



1. An apparatus for the disposal of flue gas from a gas or liquid-fuel boiler-burner group, the said apparatus comprising

at least one processing unit which has a first compartment arranged to receive at the upper end thereof flue gas from the boiler-burner group and is provided at the top thereof with a nozzle or nozzles designed to eject water in the said first compartment to scrub, cool and carry away the said flue gas therein,

a second compartment arranged to receive at the lower end thereof scrubbed gases released from the said first compartment to further treat them while flowing upwardly along it and includes a nozzle or nozzles at the upper end thereof arranged to eject water there-in to further scrub, cool and purify the said scrubbed flue gas countercurrently flowing upwardly along it, an exhaust duct or opening for the treated flue gas, a fresh water supply system, a scrubbing column, and a water ejecting nozzle or nozzles disposed at the top of the column and in fluid communication with the fresh water supply system to further scrub and cool the said purified gases issuing from the said second compartment,

a collecting unit disposed underneath the said processing unit to receive scrubbing water and scrubbed flue gases directly from it and to direct the said scrubbed flue gases into the said second compartment, and

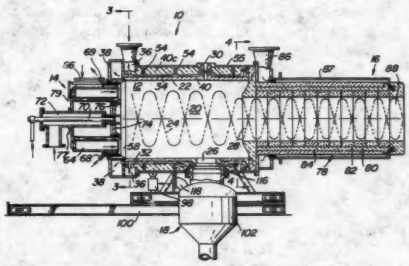
a recycling and filtering system arranged to filter the scrubbing water released from the said collecting unit and to recycle it to the said nozzle or nozzles in the said processing unit.

4,624,191

AIR COOLED CYCLONE COAL COMBUSTOR FOR OPTIMUM OPERATION AND CAPTURE OF POLLUTANTS DURING COMBUSTION

Bert Zauderer, Merion, and Vincent Tilli, Broomall, both of Pa., assignors to Coal Tech Corp., Merion Station, Pa.

Filed Dec. 14, 1984, Ser. No. 681,875
Int. Cl.[4] F23D *1/02*
U.S. Cl. 110—264 **26 Claims**



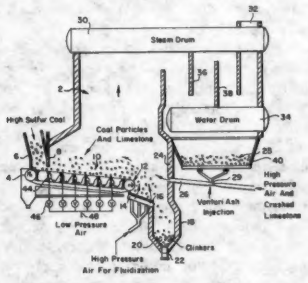
11. Cyclone coal combustor apparatus comprising a generally horizontally disposed cylindrical chamber and a non-sacrificial refractory liner disposed within said chamber, air cooling means disposed within said chamber and at least partly embedded within said liner, said air cooling means comprising a plurality of generally U-shaped tubes having first and second leg portions interconnected by bight portions, said leg portions extending in a direction generally axially with respect to said chamber and comprising respective supply and return legs, said air cooling tubes being so arranged that a supply leg of one tube lies adjacent a return leg of another tube, said tubes forming a generally cylindrical enclosure for said liner.

4,624,192

FLUIDIZED BED COMBUSTER PROCESS

Vaughn Mansfield, Gallatin, Tenn., assignor to Mansfield Carbon Products, Nashville, Tenn.

Filed Mar. 20, 1986, Ser. No. 841,784
Int. Cl.[4] F23J *3/00*
U.S. Cl. 110—344 **3 Claims**



1. A process for burning high-sulfur coal while removing the sulfur therefrom, comprising;

transporting, on a run of an endless grate, a burning bed of high sulfur coal through a furnace from an input end of the furnace to a laterally spaced output end thereof while feeding air upwardly through the bed in quantities and at pressures sufficient only to react with most of the carbon content of the coal in the bed while creating an atmosphere of sulfur-laden gaseous by-products above the bed,

free-falling a residue of clinkers and small particles of burned

and partly burned coal off the end of the grate run, blowing through the free-falling residue with an upward blast of air of a force sufficient to elevate the small particles upwardly to a level higher than the bed but of insufficient force to divert the clinkers from free-falling into a collector,

blasting the elevated particles back through the atmosphere above the burning bed towards the front end of the furnace with a blast of air with limestone particles entrained therein so that the air reacts with at least most of the carbon contents of the particles while the limestone particles react with and grab the sulfur in the atmosphere above the bed,

and forming clinkers consisting of the reacted particles, which clinkers drop onto the burning bed and ride thereon through the furnace and drop off at the end of the grate run.

4,624,193

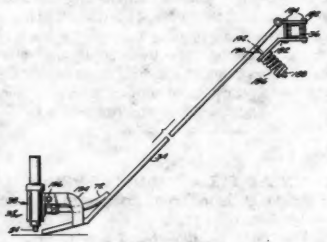
METHOD AND APPARATUS FOR THE JET INJECTION OF AGRICULTURAL LIQUIDS INTO THE SOIL

Douglas Johnston, Decatur, Ala., assignor to John Blue Company, New York, N.Y.

Continuation of Ser. No. 491,275, May 4, 1983, abandoned. This application Aug. 15, 1985, Ser. No. 766,080

Int. Cl.[4] A01C *23/62*

U.S. Cl. 111—6 **18 Claims**



1. The method of applying an agricultural liquid into the soil, without appreciable disturbance thereof, from a moving vehicle, the steps comprising:

providing a positive displacement, adjustable-delivery-rate pump movable with the vehicle for receiving agricultural liquid from a supply thereof and continuously and substantially without interruption delivering it under a predetermined range of high pressure;

distributing at its delivered pressure and rate the delivered liquid sequentially to multiple nozzles movable with the vehicle and spaced generally uniformly transversely of the direction of vehicle movement to form closely adjacent the soil generally downward directed successive jets of the liquid and form generally parallel uniformly spaced rows of injections of the liquid in the soil, each injection being of substantially the same predetermined quantity of liquid and each jet having sufficient velocity and sufficiently small cross-sectional area to inject the liquid into the soil to an agronomically effective depth therein without appreciable disturbance thereof;

timing the distribution of the liquid sequentially to the nozzles at a frequency proportional to the ground speed of the vehicle so that the injections are spaced apart on centers in the rows the same predetermined distance; and

adjusting the delivery rate of the pump to obtain a selected substantially constant rate of application of the liquid to the soil.

4,624,194

PROBE FOR BREAKING AND INJECTING SOIL

Eugen Zinck, Hueffelsheimer Strasse 2, D-6550 Bad Kreuznach, Fed. Rep. of Germany

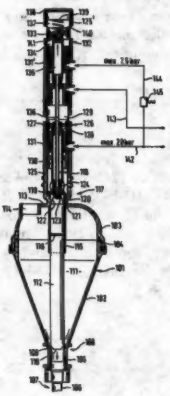
PCT No. PCT/DE83/00207, § 371 Date Aug. 2, 1984, § 102(e) Date Aug. 2, 1984, PCT Pub. No. WO84/02251, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 10, 1983, Ser. No. 641,967

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245912

Int. Cl.[4] A01C *23/02*

U.S. Cl. 111—7.2 **20 Claims**



1. Apparatus for pneumatically loosening and breaking open soil and adapted to be used for the cultivation of plants, comprising:

(a) a reservoir adapted to contain a substance that can be entrained with compressed air for partially filling the passages resulting from the breaking up of the soil;

(b) a rapid closing valve mounted adjacent the upper end of said reservoir, and means for opening and closing said rapid closing valve;

(c) an injector valve mounted adjacent the lower end of said reservoir and having a valve seat;

(d) a vertically reciprocable injector tube extending upwardly through said reservoir, said injector valve being in flow communication at its upper ends with compressed air upon the opening of said rapid closing valve, and having a lower end air outlet, said lower end having means to alternately engage and disengage said seat of said injector valve thereby to control the flow of substance from said reservoir, and

(e) a probe in fluid flow communication with the lower end of said injector tube, said probe having means to release compressed air immediately after said rapid closing valve is opened, into the adjoining soil for breaking up the same; and

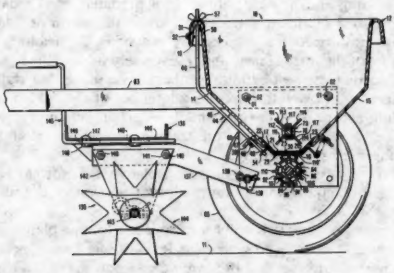
means for raising said tube responsive to the opening of said rapid closing valve to disengage said tube from said valve seat whereby compressed air is first discharge downwardly through said tube to said probe, followed by the opening of said injector valve to permit said substance to be discharged from said reservoir by entrainment with said compressed air.

4,624,195

GRAVITY SPREADER

Charles W. Doering, Louisville, Ky., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Filed Jul. 20, 1984, Ser. No. 632,968
Int. Cl.[4] A01C 7/08
U.S. Cl. 111—12 10 Claims



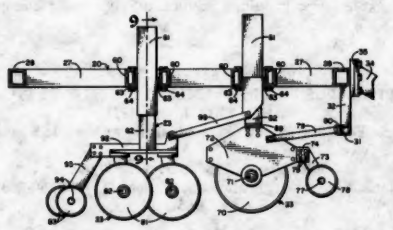
1. A gravity spreader including:
a hopper having an open upper end, a bottom wall, and a plurality of walls extending upwardly from said bottom wall to form said open upper end;
a pair of substantially parallel plates extending downwardly from said walls of said hopper beyond said bottom wall;
a shaft rotatably supported by each of said plates;
a wheel supported on each end of said shaft, at least one of said wheels being always connected to said shaft to cause rotation of said shaft with said wheels;
opening means in at least said bottom wall of said hopper to allow material in said hopper to flow therethrough;
control means to control whether said opening means is open or closed and the amount that said opening means is open to control the rate of flow of material from said hopper;
means rotatably mounted on said shaft and disposed beneath said opening means to allow flow from said hopper through said opening means to the ground when said opening means is open and only when said hopper is moved in a forward direction;
and connecting means to connect said rotatably mounted means to said shaft for rotation therewith only when said wheels rotate to move said hopper in a forward direction.

4,624,196

COMBINED SEED DRILL AND FERTILIZER APPLICATOR

Edwin V. Anderson, R.R. No. 1, Potlatch, Id. 83855

Filed Aug. 9, 1985, Ser. No. 764,209
Int. Cl.[4] A01C 5/06
U.S. Cl. 111—52 6 Claims



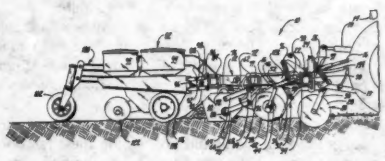
1. In an agricultural seeder and fertilizer applicator having a plurality of seed disperser and fertilizer disperser elements, means for carrying a supply of material to be dispersed, and means of dispersing material to the plurality of disperser elements, the invention, comprising, in combination:
a compound frame having a lower frame element supported for locomotion over an underlying surface and an upper frame element thereabove pivotably communicating with the forward portion of the lower frame element with hydraulic means communicating between the upper and lower frame elements to raise the upper frame element relative to the lower frame element, each frame element having subframe structure to support applicator components;
a plurality of material dispersement elements with lowermost cutter disks each dispersement element having an upper fastening shank defining a medial channel extending therethrough and carrying a depending mounting shank for slidable motion in said channel, each said mounting shank defining an internal channel with an hydraulic cylinder carried in the upper portion of the fastening shank channel and in the mounting shank channel to interconnect the fastening shank and mounting shank and slidably move each associated set of the said shanks relative to each other and
hydraulic powering means to move the upper frame element relative to the lower frame element and to move the fastening shank of each dispersement element relative to the associated mounting shank.

4,624,197

MINIMUM TILLAGE TOOLBAR AND METHOD FOR USING SAME

Denny Drake, R.R. 4, Box 164, Davenport, Iowa 52804

Continuation of Ser. No. 443,442, Nov. 22, 1982, abandoned.
This application Jul. 17, 1985, Ser. No. 756,100
Int. Cl.[4] A01B 51/00
U.S. Cl. 111—52 17 Claims



1. A minimum strip tillage farm implement for pulling by a tractor means and adapted for single pass seed bed preparation and planting of crop rows, as well as for operative connection or means for selective insecticide, herbicide and fertilizer application when in a first mode, and having a second mode for use as a power cultivator in-between said crop rows, said implement comprising:
a tool bar frame comprised of detachable removeable, interconnecting frame members and spaced apart front, middle, and rear tool bars for attachment of a plurality of sets of ground working implements, said tool bars being detachably adjoined by said interconnecting frame members;
in said first mode said tractor means being operatively connected by tractor connection means to a first position on said front tool bar and each said set of ground working implements being aligned in series along said front, middle and rear tool bars for preparation of one crop row as follows, said front tool bar carrying at least trash cutting means, said middle tool bar carrying individually powered, individually floating rototillers to prepare a strip tillage seed bed, and said rear tool bar carrying detachable planters; and
wherein said front and rear tool bars are removeable by detaching said detachable interconnecting members at least from said middle tool bar to leave only said middle

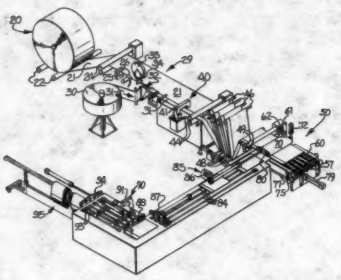
tool bar and power rototillers for use in a second mode, said tractor means being operatively connectable by said tractor connection means to a second position on said middle tool bar offset from said first position on said front tool bar in a manner to allow operation of said implement is said second mode as in-between-row power cultivators.

4,624,198

METHOD AND APPARATUS FOR FABRICATING PILLOWCASES WITH ATTACHED HEMS

Hoyt W. Beam, Concord; Gregory A. Ball, Mooresville, and Byron E. Moore, Kannapolis, all of N.C., assignors to Cannon Mills Company, Kannapolis, N.C.

Filed Nov. 1, 1985, Ser. No. 794,304
Int. Cl.[4] D05B *13/00*
U.S. Cl. 112—10 **11 Claims**



1. An apparatus for successively fabricating pillowcases with attached hems, said apparatus comprising

a supply source of continuous open width textile fabric with side edges along opposite sides thereof and being of a width sufficient to form the length of a pillowcase,

means for successively withdrawing predetermined lengths of the pillowcase fabric from said supply source and along a horizontal first path of travel in a lengthwise direction,

a supply source of continuous textile fabric of a width sufficient to form a hem,

a hem forming station including means for longitudinally folding the hem fabric and positioning the edge portions above and below one side edge of the pillowcase fabric as the pillowcase fabric is traveling lengthwise along said first path of travel,

a hem stitching station including means for sewing the edge portions of the folded hem fabric to said one side edge of the pillowcase fabric,

a folding station including means for receiving the leading end portion of the hemmed pillowcase fabric from said hem stitching station and folding the leading end portion transversely across the width of the pillowcase fabric and onto the trailing adjacent portion to form superposed upper and lower layers,

a cutting station positioned in the longitudinal path of travel of the widthdrawn predetermined lengths of pillowcase fabric, said cutting station including cutting means for transversely cutting the hemmed pillowcase fabric adjacent the leading end of the folded-over upper layer of the pillowcase fabric to form individual pillowcase blanks,

conveying means for successively moving the individual blanks along a horizontal second path of travel in a lengthwise direction from said cutting station,

a side seaming station for receiving the overlying side edges and sewing together the folded hems and trailing side edges as the pillowcase blank is conveyed through said side seaming station,

conveying means for successively moving the individual blanks along a third horizontal path of travel in a widthwise direction, and

a bottom end seaming station for receiving and sewing together the overlying bottom ends as the pillowcase blank is conveyed through said bottom end seaming station.

5. Folding means, suitable for use in an apparatus for successively fabricating textile fabric articles, such as pillowcases and the like, including means for successively conveying predetermined lengths of textile fabric in a lengthwise direction with the leading end being positined in a predetermined location during such fabrication; the combination therewith of folding means positioned for successively receiving the leading end portion of the textile fabric and transversely folding the leading end portion of the textile fabric back over upon the trailing adjacent portion with opposite side edges of the folded over leading end portion in substantially overlying alignment with the opposite side edges of the trailing adjacent portion, said folding means comprising

vertically reciprocating clamping plate means for engaging and clamping the trailing adjacent portion of the textile fabric,

horizontally and vertically reciprocating folding plate means initially positioned below the level of said clamping plate means for receiving the leading end portion of the textile fabric in overlying relationship thereon,

first operating means for vertically raising said folding plate means and the overlying leading end portion of the textile fabric above the level of said clamping plate means, and

second operating means for horizontally moving said folding plate means into overlying relationship above said clamping plate means to position the leading end portion of the textile fabric in folded position overlying said clamping plate means.

6. In an apparatus for successively fabricating textile fabric articles, such as pillowcases and the like, including means for successively conveying predetermined lengths of textile fabric in a lengthwise direction with the leading end being positioned in a predetermined location during such fabrication; the combination therewith of folding means positioned for successively receiving the leading end portion of the textile fabric and transversely folding the leading end portion of the textile fabric back over upon the trailing adjacent portion with opposite side edges of the folded over leading end portion in substantially overlying alignment with the opposite side edges of the trailing adjacent portion, said folding means comprising

vertically reciprocating clamping plate means for engaging and clamping the trailing adjacent portion of the textile fabric,

horizontally and vertically reciprocating folding plate means initially positioned below the level of said clamping plate means for receiving the leading end portion of the textile fabric in overlying relationship thereon,

first operating means for vertically raising said folding plate means and the overlying leading end portion of the textile fabric above the level of said clamping plate means, and

second operating means for horizontally moving said folding plate means into overlying relationship above said clamping plate means to position the leading end portion of the textile fabric in folded position overlying said clamping plate means.

4,624,199

APPARATUS FOR PREVENTING FALL OF BUTTON PARTS FROM A CHUTE

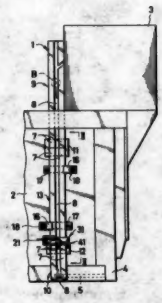
Keiichi Yoshieda, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Feb. 7, 1986, Ser. No. 827,096
Claims priority, application Japan, Feb. 21, 1985, 60-24072
Int. Cl.[4] D05B *3/22*
U.S. Cl. 112—113 **5 Claims**

1. In a button attaching machine having a support, a reservoir mounted on an upper portion of said support for containing a multiplicity of button parts, a terminal guide mounted on

a lower portion of said support, and a chute assembly for conveying the button parts successively from said reservoir to said terminal guide, said chute assembly including an upper chute connected to said reservoir, a lower chute connected to said terminal guide, and an intermediate chute detachably mounted on said support for extending between said upper and lower chutes so as to define jointly with said upper and lower chutes a combined channel for receiving the button parts in a row, said intermediate chute having through its entire length a pair of confronting flanges, defining therebetween a longitudinal aperture opening to said channel;

an apparatus for preventing the button parts from falling from said intermediate chute when the latter is detached, said apparatus comprising:



(a) a blocking member adapted to be supported by said intermediate chute and having a first projection and a second projection, said blocking, member being movable between a first position in which said first projection penetrates into said channel of said intermediate chute through said opening, and a second position in which said first projection is retracted from said channel;

(b) a spring normally urging said blocking member to move to said first position; and

(c) a stop adapted to be disposed adjacent to said lower end of said intermediate chute and engageable with said second projection to cause said blocking member to move to said second position against the bias of said spring when said intermediate chute is mounted on said support between said upper and lower chutes.

4,624,200

APPARATUS AND METHOD FOR FORMING A DOUBLE-FOLDED WIDE HEM IN CUT TEXTILE ARTICLES

William S. Fisher, Concord, N.C., assignor to Cannon Mills Company, Kannapolis, N.C.

Filed Jun. 14, 1985, Ser. No. 745,326

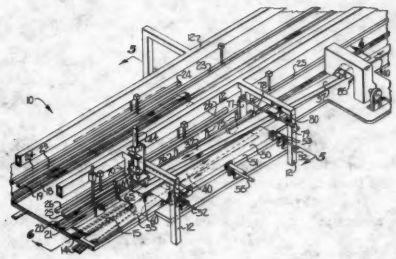
Int. Cl.[4] D05B *21/00, 35/02*

U.S. Cl. 112—121.12 **7 Claims**

1. In an apparatus for forming a double-folded wide hem in cut textile articles, such as would be used for the open entrance end of a pillowcase, the top of a bed sheet, and the like; the improvement of means carried by said apparatus for folding a double-folded wide hem along the outside longitudinally-extending edge portion of a generally horizontally-positioned cut article, said folding means comprising

movable platform means extending generally horizontally and including means for horizontally reciprocating said platform means transversely of the edge portion of the article being folded between a first position for receiving on the top thereof the edge portion of the article to be folded in an elevated position relative to the remainder fo the article and a second position transversely inwardly of the longitudinal edge portion of the article being folded for carrying such edge portion over the remainder of the article,

stationary folding shoe means having inside and outside edges extending longitudinally of the edge portion of the article to be folded and a generally horizontal upper surface of a predetermined dimension between said edges corresponding to the desired transverse dimension of the double-folded hem being formed in the article and being positioned transversely inwardly of the article from said platform means in its first position and slightly below said platform means and above the remainder of the article being folded for cooperating with said platform means to form a first fold in the article about its said outside edge and to receive the edge portion being folded of the article



on said top thereof to extend over said inside edge thereof as said platform moves to its second position extending over said stationary folding shoe, and

movable folding shoe means including means for horizontally reciprocating said movable shoe means transversely of the edge portion of the article being folded between a first position transversely inwardly from said stationary folding shoe means and slightly below said inside edge of said stationary folding shoe means and a second position extending under said inside edge of said stationary folding shoe means for cooperating therewith to fold the extending edge portion of the article about and under said inside edge of said stationary folding shoe means to form a second fold in the article.

4,624,201

SEWING MACHINE WITH A BASE CONSISTING OF TWO DETACHABLY CONNECTED MODULES

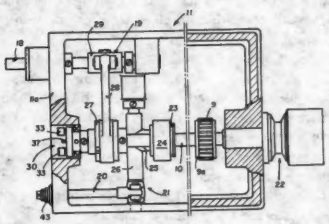
Ezio Maggi, Certosa Di Pavia, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Dec. 12, 1985, Ser. No. 808,189

Claims priority, application Italy, May 27, 1985, 21971/85[U]

Int. Cl.[4] D05B *1/00, 3/24, 73/00*

U.S. Cl. 112—168 **6 Claims**



1. A sewing machine with a base consisting of two modules connected detachably to each other, of the type comprising inside the said base at least: a rotating main shaft which can be driven by a motor and which is provided with parts for trans-

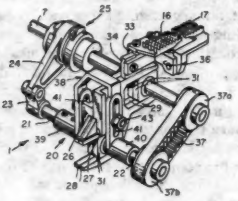
mitting the movement to an upper shaft located inside the arm of the sewing machine, an oscillating side shaft connected via a first kinematic assembly driven by a first eccentric means on said main shaft and designed to actuate the movements of the feed teeth of the sewing machine, and a hook operating rod connected via a second kinematic assembly driven by a second eccentric means on said main shaft, wherein said second kinematic assembly includes a spindle extending in a direction transverse to the main shaft and located between said first and second eccentric means, and wherein the said base can be transversely disassembled into a central module and into a base module so as to divide the said main shaft, side shaft and hook operating rod into successive sections, and wherein joining components forming substantially axial coupling devices are arranged on the facing parts of the said successive sections.

4,624,202

SEWING MACHINE DIFFERENTIAL FEED

Adriano Alberti, and Mario Valle, both of Pavia, Italy, assignors to Rockwell-Rimoldi S.p.A., Italy

Filed Dec. 12, 1985, Ser. No. 808,190
Claims priority, application Italy, Apr. 30, 1985, 21676/85[U]
Int. Cl.[4] D05B *27/24*
U.S. Cl. 112—313 **8 Claims**



1. A device for feeding fabric being sewn by a sewing machine comprising:

a. a rotatable main shaft;

b. a secondary shaft mounted adjacent said main shaft having its axis extending parallel to thereto, said secondary shaft being made of first and second half-shaft sections aligned and freely rotatable with respect to each other which are rotatably joined;

c. a stitch adjustment eccentric mechanism mounted on said main shaft and operably connected to said first section of said secondary shaft to effect oscillation thereof;

d. means connecting the said second section of said secondary shaft to said main shaft to effect continuous rotation thereof;

e. support means including sets of main and secondary feed dog teeth supported by block mounted cams, one of said two block mounted cams being mounted on said main shaft and the other of said block mounted cams being mounted on said secondary shaft;

f. a generally U-shaped stirrup having a first sleeve on one end secured to said first section of said secondary shaft; and having a second sleeve freely mounted on said second section of said secondary shaft and

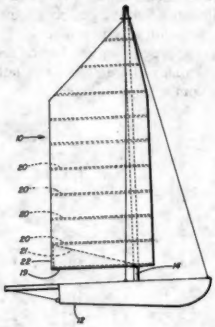
g. sliding elements mounted on the arms of said U-shaped stirrup; said device causing said feed dog teeth to move cyclically up and down and forward and backward in a synchronized manner to a tensioned fabric on a needle plate.

4,624,203

BATTEN STRUCTURE FOR A WING SAIL

R. Stirling Ferguson, P.O. Box 462, Arnprior, Ontario, Canada K7S 3L9

Filed Mar. 25, 1985, Ser. No. 715,556
Claims priority, application Canada, Apr. 19, 1984, 452409
Int. Cl.[4] B63H *9/06*
U.S. Cl. 114—39 **14 Claims**



1. An airfoil batten structure for use in combination with similar batten structures held in spaced apart relation within a wing sail comprising:

a beam having a front portion with aperture means for slidably engaging a support such as a mast and having a rear portion rigid with said front portion,

a nose piece pivotably connected to the front end of said beam by pivot means forward of said aperture means, said nose piece having side surfaces shaped to provide the front end portion of an airfoil,

two flexible elongated batten members each extending rearwardly from opposite sides of the nose piece outside of said beam, said members having front ends rigidly connected to the nose piece and providing continuations of said side surfaces and having rear ends slidably connected together rearwardly of the rear end of the beam, and

elongated spreader means having opposite ends thereof connected to said batten members to link said members together and being movable relative to said beam, the arrangement of said spreader means, beam, nose piece and batten members being such that sail pressure acting on a windward one of the batten members can cause a central part of this batten member between the nose piece and the beam rear end to be flexed towards the beam and into a shape determined by direct or indirect contact with the beam causing pivoting of the nose piece towards the windward side and while the other batten member is held away from the beam and in convex shape by the spreader means and by the pivoting of the nose piece, the said shapes of the batten members together with the nose piece forming a cambered airfoil section.

4,624,204

MAST RAISING AND LOWERING DEVICE

William A. Temple, 2974 Ingalls Way, Eugene, Oreg. 97405

Filed Jul. 29, 1985, Ser. No. 759,753
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—91 **2 Claims**

1. A mast raising and lowering device for sailboats comprising:

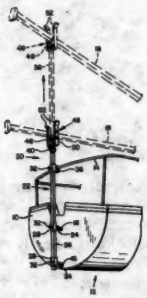
(a) an adjustable telescoping pole assembly;

(b) means for attaching said telescoping pole assembly to the stern of a sailboat which employs an outboard rudder, which means include pintle-like pin attachment members, adjustably connected to the base section of the said tele-

scoping pole so that the pintle-like pins fit into, and the said telescoping pole is supported by, those already existing gudgeons which are otherwise used to mount the outboard rudder and are available when the outboard rudder is removed; and

(c) a roller located on the topmost portion of said telescoping pole assembly;

wherein, in a mast raising operation, the mast being normally retained in an approximately horizontal, down position on the roller during trailering and moorage of the sailboat with the base of the most forward and the top of the mast to the stern, the said telescoping pole assembly is extended upwards, thereby lifting the top portion of the mast at the stern of the sailboat; the mast is then supportedly moved on said roller towards and over the stern of the sailboat so



as to locate the base of the mast in its proper position for connection to the sailboat for raising; and finally the mast is raised from its partially elevated position atop the said roller and expanded telescoping pole assembly to its final vertical position;

and, in lowering the mast from the vertical position to the horizontal, first the telescoping pole assembly is extended upwards so as to provide an elevated catching and resting place for the mast on the roller; next the mast is lowered to said elevated position; the base of the mast is then detached from the sailboat and moved forward, the mast moving supportedly on the roller atop the elevated pole assembly; and finally the telescoping pole assembly is retracted downwards into the approximately horizontal position used for trailering and moorage.

4,624,205

METHOD OF STRESS DISTRIBUTION IN A SAIL, A SAIL EMBODYING THE SAME AND SAIL CONSTRUCTION

Peter G. Conrad, Old Lyme, Conn., assignor to Sobstad Sailmakers, Inc., Old Saybrook, Conn.

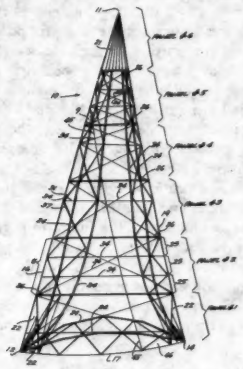
Continuation-in-part of Ser. No. 681,933, Dec. 14, 1984, Pat. No. 4,593,639. This application Apr. 11, 1985, Ser. No. 722,268

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] B63H *9/06*

U.S. Cl. 114—103 **30 Claims**

1. As an article of manufacture, a sail, comprising a skin member of a plurality of panels, a plurality of pliant grid members integral with said skin member, said grid members defining a lattice work pattern on said sail, interconnectingly with said panels as load bearing members for said sail; a plurality of pliant structural members integral with said skin member and interconnecting with said panels for load bearing with said skin member and with said grid members, said plurality of structural members interconnectingly joining said panels and projecting interconnectingly into a point-load location for said sail; said grid members also joining interconnectingly said



structural members in said sail, and wherein said grid members define a latticework pattern on at least two panels for said sail.

4,624,206

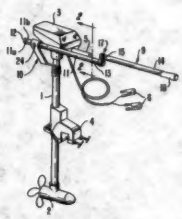
FOLDABLE AUXILLIARY STEERING ARM FOR TROLLING MOTORS

Richard D. Frye, 900 Lime La., Marathon, Fla. 33050; John P. Huff, 778 Kindra Dr., Henderson,, Tenn. 38340, and Rhodes H. Barnette, 3080 S. Highland, Jackson, Tenn. 38301

Filed Apr. 9, 1985, Ser. No. 721,452

Int. Cl.[4] B63H *21/17*

U.S. Cl. 114—146 **5 Claims**



1. For use with an electric trolling motor of the type comprising a support column to be secured to a boat with the support column generally upright so as to have an upper end and a lower end, a submersible motor-and-propeller unit mounted on the lower end of the support column, and a housing secured to the upper end of the support column, a steering arm comprising the combination of

a mounting bracket comprising

a lower end portion of such shape as to be capable of being fitted against a portion of the support column of the trolling motor adjacent the housing,

securing means for securing the lower end portion of the mounting bracket to the support column,

an upper end portion having a free end portion which extends generally circularly and has an opening which is radial with respect to the axis of curvature of the circularly extending portion and is directed away from the housing of the trolling motor when the mounting bracket is secured to the support column, and

an intermediate portion of such shape and length that, when the lower end portion of the mounting bracket is secured to the support column of the trolling motor, the upper end

portion of the mounting bracket is spaced laterally from the housing of the trolling motor;

a first arm portion having first and second ends,

the circularly extending free end portion of the mounting bracket embracing the first arm portion, and

the first arm portion having at least one radial opening capable of alignment with the opening in the circularly extending free end portion of the mounting bracket,

the first arm portion being secured to the mounting bracket by a fastener extending through the opening in the mounting bracket and engaged in the opening in the first arm portion;

a second arm portion having first and second ends; and

pivot means connecting the first end of the second arm portion to the second end of the first arm portion and operative to allow the second arm portion to be pivoted relative to the first arm portion from a first position, in which the second arm portion extends generally in the same direction as does the first arm portion, to a stowed position in which the second arm portion lies adjacent to the first arm portion.

4,624,207

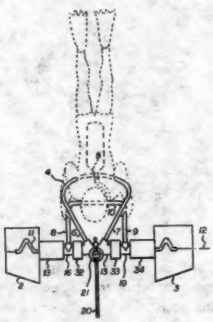
DIVING PLANE

John D. King, 184 Vaile St., Tewksbury, Mass. 01730

Filed Jan. 29, 1985, Ser. No. 695,964

Int. Cl.[4] B63C *11/46*

U.S. Cl. 114—315 **13 Claims**



1. An underwater towed diving plane ridden by a diver that includes wings controlled by the diver for controlling the diving angle of the plane as it is towed through water comprising,

(a) a pair of wings,

(b) a longitudinal diver support member for supporting the diver in the prone position,

(c) a lateral wing support bar to which said wings are rigidly attached at the ends thereof, evenly spaced from the center of said bar,

(d) a pivot fitting that pivotally fits said bar at the center thereof and to which the front end of said longitudinal diver support member is rigidly attached and

(e) a diving control lever rigidly attached to said bar for rotating said bar about its axis with respect to said longitudinal diver support member to control the diving angle of said diving plane.

4,624,208

MAST SUPPORTING STRUCTURE

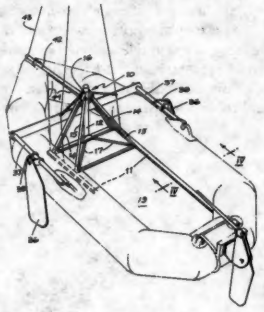
Douglas C. Hyne, 49 George Street, Marmong Point, NSW, Australia

Filed Apr. 1, 1985, Ser. No. 718,421

Claims priority, application Australia, Apr. 2, 1984, PG4372

Int. Cl.[4] B63B *7/08*

U.S. Cl. 114—345 **8 Claims**



1. A mast support structure for use in an inflatable dinghy which comprises at least two lateral hull sections and an intermediate floor, the structure comprising

a pair of substantially longitudinally extending stringer members adapted for connection to the floor of the dinghy;

a mast receiving tube adapted to receive the lower end of a mast carrying a sail;

a substantially transversely extending support member on which the mast receiving tube is adapted to be connected and comprising a central part which is connectable to the lower end of the mast receiving tube and is pivotably connected to a pair of lateral parts of the support member each of which lateral parts is adapted to be releasably connected at its free end to a respective one of the stringer members;

a first pair of struts disposed substantially coplanar with the support member, each of which struts is pivotably connected at one end to the mast receiving tube at a point distal to the support member and connectable at its other end to a respective one of the stringer members;

a second pair of struts each of which is pivotably connected at one end to the mast receiving tube at a point distal to the support member and is adapted to be releasably connected at its other end to a respective one of the stringer members at a position distal to that stringer members position of attachment to the support member; and

a third pair of struts each of which is connectable at one end to the central part of the support member and its other end to a respective one of the stringer members distal to that stringer member's position of attachment to the support member.

4,624,209

PORTABLE MULTI-HULL WATERCRAFT KIT

Victor R. Loffler, 32851-6th Avenue, Mission, B.C., Canada V2V 1Z2

Filed May 25, 1984, Ser. No. 614,060

Claims priority, application Canada, Jan. 6, 1984, 444839

Int. Cl.[4] B63B *7/00*

U.S. Cl. 114—354 **21 Claims**

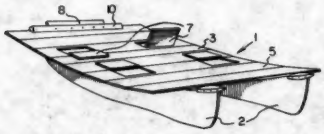
21. A kit for converting at least two watercraft hulls having gunwales into a multi-hulled watercraft comprising:

(a) a deck adapted to bear on said gunwales;

(b) means for aligning said deck on said gunwales; and

(c) means for removably securing said deck to said gunwales,

wherein said deck is adapted to receive a strapping means and wherein said securing means comprises a body, having an upper surface and a passageway adapted to receive a strapping means, said passageway opening adjacent one



end of said upper surface, passing through said body in a substantially continuous path and emerging adjacent the opposite end of said upper surface, said body being adapted to receive means for securing said body to the hull of said watercraft.

4,624,210

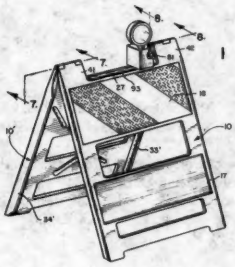
BARRICADE

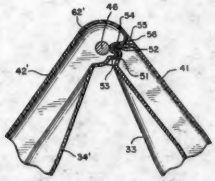
Geoffrey M. Glass, 21 Bridlewood Rd., Northbrook, Ill. 60062

Filed Dec. 27, 1984, Ser. No. 686,930

Int. Cl.[4] E01F *9/04*

U.S. Cl. 116—63 P **7 Claims**





1. An improved plastic barricade comprising two integrally molded, generally planar panel units hinged together by one or more bolts extending through one or more bolt holes formed in hinge members integrally molded on said panel units, each of said panel units including reinforcing ribs outstanding from the back of the plane of the panel units, wherein:

(a) (i) said hinge members extend from the panel units at an angle obtuse to the plane of the panel units,

(ii) said reinforcing ribs extend onto said hinge members, and

(iii) said reinforcing ribs are shaped and positioned relative to one another and said hinge members so that said panel units may collapse to a closed, storage relationship wherein the planes of the panel units are parallel opposing ones of said reinforcing ribs intermesh in a side-by-side relationship; and

(b) said hinge members include detent means which oppose the collapse of the panel units from an open relationship to said closed relationship, said detent means comprising plastic notches and protuberances which cause portions of said hinge members to elastically deform as said panel units are spread to or collapsed from said open relationship.

4,624,211

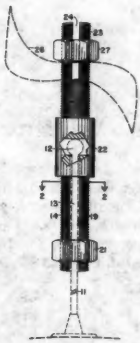
DEVICE FOR MARKING CARS

Isidore Jokel, 4021 Newport H, Deerfield Beach, Fla. 33441

Filed Jun. 12, 1985, Ser. No. 743,781

Int. Cl.[4] B60Q *1/26*; H01Q *1/12*

U.S. Cl. 116—209 **5 Claims**



1. A device for positively locking a flag or other display onto an automobile antenna having an enlarged tip at the top of an elongated stem comprising:

(A) an externally threaded rodlike member comprising walls defining a lengthwise channel, said channel being large enough to accept said stem and small enough to reject said tip,

(B) lower nut means surrounding said rodlike member for confining said stem within said channel,

(C) internally threaded sleeve means threaded onto said rodlike member and surrounding said said tip, and

(D) a screw threaded into the top of said sleeve down upon said tip thereby locking said tip into said sleeve.

4,624,212

APPARATUS COMPRISING A PERFORATED DRUM

Alfred G. Ellis, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Filed Jul. 27, 1982, Ser. No. 402,794

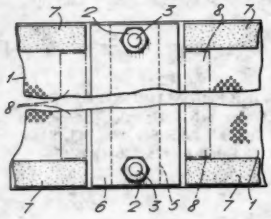
Claims priority, application United Kingdom, Aug. 10, 1981, 8124376

Int. Cl.[4] A23G *3/20*

U.S. Cl. 118—19 **6 Claims**

1. A modified perforated drum coating machine which contains at least one securing means which is attachable to the perforated drum, and at least one mesh member consisting of suitably sized mesh, each outer edge of which is attached to a strip of thin springy material, and a strip of deformable rubber or plastics material which is positioned against the inward facing part of the edge of the perforated part of the drum at at least two arcuate portions thereof, the or each securing means being adapted to engage with and secure, on the inside of the drum, two non-adjacent mesh member edges, the edges of the mesh member or members, which edges are adjacent the said deformable strips which are themselves adjacent the said arcuate portions of the perforated drum, being slightly over-long and when secured in position the or each mesh member is

sprung in an outward direction against the said deformable strips, and wherein the total area of the mesh member or members is essentially the same as the area of the perforated part of the drum.

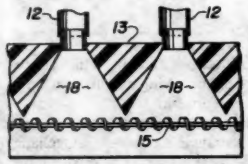


4,624,213

CURTAIN COATING APPARATUS AND METHOD OF USE

Harry F. Long; Donald J. Misselhorn, both of East Hempfield Township, Lancaster County, and Michael Tomchany, Manheim Township, Lancaster County, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 27, 1985, Ser. No. 769,695
Int. Cl.[4] B05B *1/04*
U.S. Cl. 118—300 **6 Claims**



1. Homogenization apparatus, said apparatus comprising manifold means adapted to receive a plurality of viscous fluid streams,

interfacing zones disposed within said manifold to bring contiguous streams into intimate contact,

an exit slot in the bottom of said manifold, said slot running substantially the length of said manifold and,

agitator means disposed longitudinally in said manifold means between said interfacing zones and said slot, said agitator means being capable of rotation and oscillation so as to induce homogenization of said streams.

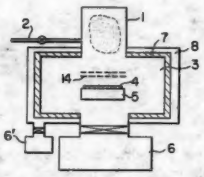
4,624,214

DRY-PROCESSING APPARATUS

Keizo Suzuki, Hachioji; Ken Ninomiya, Tokyo; Shigeru Nishimatsu, Kokubunji, and Sadayuki Okudaira, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 539,387, Oct. 6, 1982, abandoned. This application Jun. 10, 1985, Ser. No. 742,389
Claims priority, application Japan, Oct. 8, 1982, 57-176134
Int. Cl.[4] H01L *21/306*
U.S. Cl. 118—719 **9 Claims**

1. A dry-processing apparatus comprising an evacuatable chamber including a gas decomposing chamber and a reaction chamber, said gas decomposing chamber and said reaction chamber being distinct from and connected to one another, means for introducing gas into said gas decomposing chamber, means for decomposing the gas to produce active particles in said decomposing chamber, a workpiece support disposed in said reaction chamber for supporting a workpiece, electrode means disposed between the gas decomposing chamber and the workpiece support and adapted to be applied with predetermined electric potential for allowing only neutral particles to flow therethrough from said decomposing chamber to said workpiece support, whereby the workpiece is to be subjected to surface processing by the flow of said neutral particles allowed to flow through said electrode means and being incident thereupon, an evacuation system for maintaining vacuum in said evacuatable chamber, and a cold trap provided along at least a portion of the inner wall of only said reaction chamber.

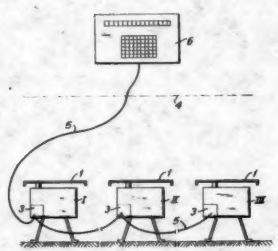


4,624,215

SYSTEM USED IN RAISING LIVESTOCK

Yehiel Goldstein, 16 Lohamay Hagetaot Street, Petah Tikva, Israel

Continuation of Ser. No. 505,075, Jun. 16, 1983, abandoned. This application Oct. 1, 1984, Ser. No. 657,037
Claims priority, application Israel, Jan. 5, 1983, 67627
Int. Cl.[4] A01K *45/00*
U.S. Cl. 119—51 R **9 Claims**



1. A method of determining the state of poultry birds raised in a closed poultry house with a floor on which the birds stand comprising the steps of:

(a) providing a weighing apparatus with an elevated platform including with a load cell with the platform spaced upwardly from the floor of the poultry house at a height at which the birds are capable of jumping from the floor onto the platform,

(b) permitting the birds to jump randomly onto the platform,

(c) obtaining a signal for each bird jumping onto the platform indicating the weight of the bird,

(d) transmitting the obtained signal to a computer, and

(e) calculating the average of the weights of the random number of birds weighed and based on such data determining information on the physical state of the birds in the poultry house.

4,624,216

FURNACE FOR BURNING OIL OR GAS

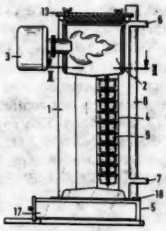
Gustav Ospelt, Vaduz, Liechtenstein, assignor to Hoval Interliz AG, Vaduz, Liechtenstein

Filed Jan. 10, 1986, Ser. No. 818,535

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 8502235[U]

Int. Cl.[4] F22B *5/00*

U.S. Cl. 122—17 6 Claims



1. A furnace for burning oil or gas; said furnace has an upper and lower end, and comprises:

a vertically disposed, approximately cylindrical water jacket;

a combustion chamber, for a burner, at the upper end of said furnace and within said water jacket;

a flue gas collector disposed at the lower end of said furnace;

at least one ancillary heating tube disposed in said water jacket and leading downwardly from said combustion chamber to said flue gas collector to provide communication from the former to the latter; below the openings of said heating tubes into said flue gas collector, the latter is provided with a chamber for collecting condensate; said last-mentioned chamber can be emptied, and has a corrosion-resistant inner side; each of said heating tubes has an inner wall, at least the lower half of which is corrosion-resistant; and

cup-shaped guide elements that are removably disposed one above the other in said heating tubes; each guide element has an upper rim portion that butts against said inner wall of a given one of said heating tubes, and also has a recessed cup portion that is radially spaced from said inner wall of that heating tube; each of said recessed cup portions has radially oriented holes for directing a plurality of individual flue gas streams against said inner wall of the associated heating tube.

4,624,217

STEAM GENERATORS HAVING A CENTRAL BODY OF THE SODIUM-WATER TYPE

André Baudoin, Marly le Roi, and René Traiteur, Ris Orangis, both of France, assignors to Novatome, Le-Plessis-Robinson, France

Filed Apr. 29, 1985, Ser. No. 728,419

Claims priority, application France, May 4, 1984, 84 06942

Int. Cl.[4] F22B *1/02*

U.S. Cl. 122—32 5 Claims

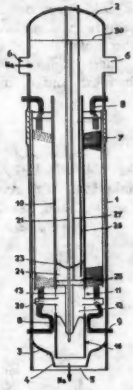
1. In a steam generator of the sodium-water type, in particular for nuclear power stations, comprising:

a cylindrical shell having a vertical axis, two crowned end walls at an upper end and lower end of the shell for closing the shell, a liquid sodium filling the shell and a slightly conical extension on the lower end wall forming a sodium outlet pipe,

a hollow central body open in an upper part thereof and disposed inside and coaxially with the cylindrical shell,

and a secondary circuit comprising a tube bundle for the circulation of water and extending in an annular space between the central body and the cylindrical shell,

the improvement wherein the central body filled with liquid sodium in an upper and middle part thereof includes in a lower part thereof a crowned end wall, means for injecting an inert gas below the crowned end wall so as to constitute a pocket which contains a small volume of gas and defines a gas-liquid separation surface for the reflection and the attenuation of a pressure wave in the event of



a sodium-water reaction, the central body further including, in the lower part thereof, a spider element which connects a lower end of the central body to an end element provided with a frusto-conical portion extending with an annular clearance into the outlet pipe for the liquid sodium which has travelled through the tube bundle.

4,624,218

HEATER, PARTICULARLY AN AUXILIARY VEHICLE HEATER

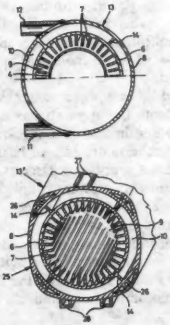
Wolfgang Bäuml, Eichenau, and Ernst Mosig, Iffeldorf, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,493

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416878

Int. Cl.[4] F22B *7/00*

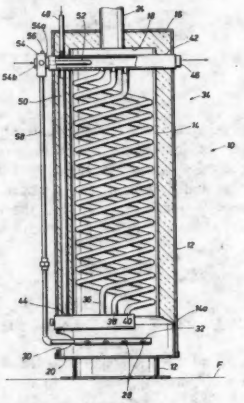
U.S. Cl. 122—136 R 18 Claims



1. In a heating device, especially an auxiliary vehicle heating device of the type having a burner aggregate, a combustion chamber formed by a burner pipe and a heat transfer arrangement concentrically surrounding the combustion chamber,

which heat transfer arrangement has an inner jacket provided with ribs and an outer jacket, an annular space being formed between the inner jacket and the burner pipe and communicating with said combustion chamber for enabling combustion gases produced in the combustion chamber to flow therethrough, and another annular space being formed between the outer jacket and the inner jacket through which a liquid heat transfer medium flows, the improvement wherein the outer jacket and the inner jacket provided with ribs are formed of a one-piece extruded profile part, and wherein the inner jacket is connected to the outer jacket by way of axially running bridges of the one-piece extruded profile part that subdivides the annular space between the inside and outer jackets in a circumferential direction.

4,624,219
HOT WATER APPARATUS
Alan B. McCorquodale, 1912 Link Ave., Orange, Tex. 77630
Filed Jan. 13, 1986, Ser. No. 818,050
Int. Cl.[4] F22B *7/04*
U.S. Cl. 122—170 **6 Claims**



1. A hot water heater apparatus adapted for instantaneous supply of high pressure water at an elevated temperature including:

an insulated heater shell;

a water heating coil assembly disposed within said shell, said coil assembly having a lower water supply manifold and an upper water outlet manifold;

a recirculating tube disposed in said shell for communicating said upper manifold and said lower manifold for enabling circulating flow of water from said upper manifold to said lower manifold;

said upper manifold having a water outlet for supplying heated water from the apparatus as desired;

a gas burner disposed in said shell adjacent said lower manifold for heating the water in said heating coil assembly;

a gas supply conduit supplying gaseous fuel to said burner;

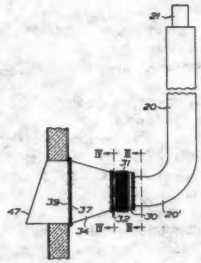
valve means mounted in said gas supply conduit for controlling the supply of gas to said burner;

said upper manifold having a water inlet spaced from said water outlet for introducing unheated water to said upper manifold, said water inlet aligned with said recirculation tube to enable preferred flow of the unheated water in a flow path across said upper manifold into said recirculating tube; and

a temperature sensing element disposed in said upper manifold in the preferred flow path of unheated water to enable immediate sensing of the supplied unheated water, said temperature sensing element sensing the heated water in the upper manifold upon displacement of the cold water from said upper manifold into said recirculating tube temperature after the heated water demand is terminated; and

means connected said temperature sensing element to said valve means to control the flow of fuel to said burner in response to the water temperature sensed by said temperature sensing element.

4,624,220
INFRASOUND GENERATOR
Mats A. Olsson, Björkrisvägen 13, S-161 39 Bromma, Sweden
Continuation of Ser. No. 712,007, Mar. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 649,957, Sep. 11, 1984, abandoned, which is a continuation of Ser. No. 588,050, Mar. 9, 1984, abandoned, which is a continuation of Ser. No. 457,071, Dec. 29, 1982, abandoned. This application Nov. 20, 1985, Ser. No. 799,290
Claims priority, application Sweden, Apr. 30, 1981, 8102755
Int. Cl.[4] F22B *37/48*; B08B *3/12*; F28D *11/06*
U.S. Cl. 122—379 **7 Claims**



1. In an infrasound generator including a quarterwave resonator tube having a closed end and an open end and of substantially uniform diameter, in which the open end of the tube is adapted to communicate with a space containing the heat exchange surfaces of a boiler through an aperture in a wall of the space, and having means for supplying pulsating pressurized air to the closed end of the resonator tube, the improvement comprising an outwardly opening conical diffuser connected between the open end of the substantially uniform diameter portion of the resonator tube and the space, a sleeve extending back from the wall and surrounding at least a portion of the length of the tube, the sleeve being of greater diameter than the tube, and resilient closure means connected between the diffuser and the sleeve.

4,624,221
COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE
Kazuyuki Fujigaya, Yokosuka; Naoki Ogawa, Yokohama; Hitoshi Shimonosono, Yokosuka, and Yutaka Minezaki, Koshigaya, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Sep. 27, 1985, Ser. No. 780,934
Claims priority, application Japan, Sep. 29, 1984, 59-204586
Int. Cl.[4] F01P *3/22*
U.S. Cl. 123—41.08 **7 Claims**

1. In an internal combustion engine having a structure subject to high heat flux, a cooling system comprising:

(a) a cooling circuit for removing heat from said structure, said cooling circuit comprising:

a coolant jacket disposed about said structure and into which coolant is introduced in liquid form and permitted to boil;

a radiator in which coolant vapor is condensed to its liquid form;

a vapor transfer conduit leading from a vapor collection space defined in said coolant jacket to said radiator;

means for returning liquid coolant from said radiator to said coolant jacket in a manner which maintains said structure immersed in a predetermined depth of liquid coolant, said liquid coolant returning means including:

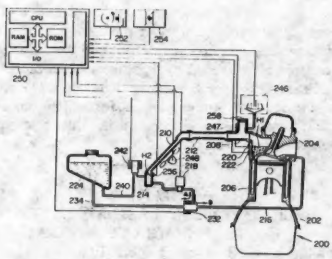
a coolant return conduit leading from the bottom of said radiator to said coolant jacket, and

a pump disposed in said coolant return conduit, said pump being selectively energizable to return coolant from said radiator to said coolant jacket through said coolant return conduit;

(b) a reservoir in which liquid coolant is stored; and

(c) valve and conduit means for selectively providing fluid communication between said reservoir and said cooling circuit, said valve and conduit means consisting of:

a first valve disposed in said coolant return conduit at a location between said pump and said coolant jacket, said first valve having a first position wherein communication between said pump and said coolant jacket is established and a second position wherein communication between said reservoir and said pump is established via a level control conduit which leads from said reservoir to said first valve, said pump being reversible so as to enable coolant to be pumped into or out of said coolant circuit when said first valve is in said second position;



a fill/discharge conduit which leads from said reservoir to the bottom of said radiator; and

a second valve disposed in said fill/discharge conduit; said second valve having a first position wherein communication between said reservoir and said radiator is cut-off and a second position wherein communication is permitted.

7. In an internal combustion engine having a structure subject to high heat flux, a method of cooling said engine comprising the steps of:

introducing liquid coolant into a coolant jacket disposed about said structure;

permitting said coolant to boil and produce coolant vapor;

condensing the coolant vapor produced in said coolant jacket to its liquid form in a radiator;

using a pump to return the liquid coolant from said radiator to said coolant jacket in a manner which maintains said structure immersed in a predetermined depth of coolant;

storing liquid coolant in a reservoir;

controlling the communication between said reservoir and a cooling circuit including said coolant jacket and said radiator using:

a first conduit which leads from said reservoir to said cooling circuit at a location between said pump and said coolant jacket;

a first valve which selectively provides communication between said pump and said reservoir via said first conduit and communication between said pump and said coolant jacket;

a second conduit which leads from the bottom of said radiator to said reservoir; and

a second valve which selectively provides and cuts-off fluid commuication between said radiator and said reservoir via said second conduit;

permitting coolant from said reservoir to be inducted into said coolant jacket and radiator when the engine is stopped and below a predetermined temperature;

displacing coolant from said coolant jacket and radiator to said reservoir via said second conduit when the engine is started and warming up; and

controlling the temperature and pressure in said coolant jacket and radiator by:

(i) increasing the exchange of heat between said radiator and a cooling medium surrounding same,

(ii) pumping coolant into and out of said radiator and coolant jacket using said pump; and

(iii) venting coolant vapor from said radiator via said second conduit when the temperature of the coolant in said coolant jacket rises above a maximum permissible level.

4,624,222

INTAKE VALVE STRUCTURE FOR INTERNAL COMBUSTION ENGINE

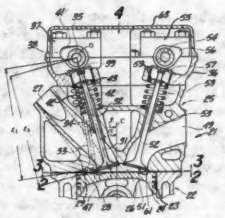
Masaaki Yoshikawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 10, 1985, Ser. No. 721,577

Claims priority, application Japan, Apr. 11, 1984, 59-70952

Int. Cl.[4] F01L *1/26*

U.S. Cl. 123—90.27 **16 Claims**



1. A valve arrangement for an internal combustion engine comprising at least three poppet type valves having head portions adapted to control the flow through respective ports serving the same combustion chamber which combustion chamber is defined in part by a reciprocating piston, each of said valves having a respective stem portion for supporting said valves for reciprocation along respective axes, said axes being disposed to intersect at a common line when viewed in a plane containing the axis of a respective one of said valves which line is perpendicular to said plane, at least one of said axes being disposed at a lesser angle to the line of reciprocation of said piston than the other of said axes, the head of said lesser angled valve lying at a lesser distance from the line of intersection than the head of another of said valves when said valves are closed.

16. An internal combustion engine having a cylinder supporting a piston for reciprocation, a cylinder head affixed relative to and closing said cylinder, at least three poppet valves supported for reciprocation about respective axes by said cylinder head on one side of a plane containing the axis of said cylinder, at least two poppet type valves supported for reciprocation by said cylinder head along axes lying on the other side of said plane, a spark plug carried by said cylinder head and having its gap disposed contiguous to said cylinder axis, a camshaft supported for rotation about a camshaft axis disposed substantially in said plane and having first and second

cam lobes formed thereon spaced on the same side of said cylinder axis, a first rocker arm having a follower engaged with said first cam lobe and having three finger portions each engaged with a respective one of the three poppet valves for operating the three poppet valves simultaneously, and a second rocker arm having a follower engaged with said second cam lobe and a pair of finger portions each engaged with a respective one of the two poppet valves for operating the two poppet valves simultaneously.

4,624,223

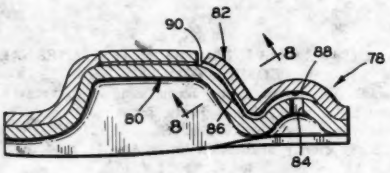
ROCKER ARM AND METHOD OF MAKING SAME

Joseph L. Wherry, Perrysburg, and Ramanlal L. Patel, Maumee, both of Ohio, assignors to Toledo Stamping & Manufacturing Company, Toledo, Ohio

Continuation of Ser. No. 412,102, Aug. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 134,447, Mar. 27, 1980, Pat. No. 4,346,678. This application Aug. 5, 1985, Ser. No. 762,335

Int. Cl.[4] F01L *1/18*

U.S. Cl. 123—90.44 **3 Claims**



1. A rocker arm of the cam-follower type having a metal body which comprises a stamped metal piece and a stamped metal strip positioned in substantially contiguous relationship and affixed together by braze metal, said piece having a rounded recess in an end portion thereof facing away from said stamped strip to receive a lifter post having an end on which said rocker arm can pivot, said end portion thereof having a hole extending therethrough communicating with said rounded recess, said piece having another end portion of inverted U-shaped configuration in transverse cross section forming an additional recess to receive an end of a valve stem, said strip and said piece having intermediate generally convex portions facing away from said recesses, said strip also having a truncated conical projection in an end portion thereof communicating with said hole and forming a reservoir facing away from said stamped piece, the other end portion of said stamped strip being of inverted U-shaped configuration in transverse cross section and being in telescoping, contiguous relationship with said another end portion of said stamped piece, said convex portion of said strip having a generally rectangular opening therein, the surface of said convex portion of said stamped piece which faces toward said strip being contiguous with edges of said rectagnular opening, with said rectangular opening forming a shallow recess with an adjacent surface of said convex portion of said piece, a long-wearing metal insert in said shallow recess to be engaged by a cam, and means affixing said metal insert to said adjacent surface in said shallow recess.

4,624,224

HYDRAULIC VALVE LIFTER

Hisashi Kodama, Nagoya, and Takuro Ono, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 24, 1984, Ser. No. 643,935

Claims priority, application Japan, Aug. 24, 1983, 58-154365

Int. Cl.[4] F01L *1/24*

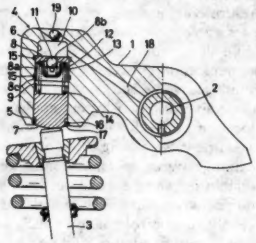
U.S. Cl. 123—90.46 **4 Claims**

1. A hydraulic valve lifter mounted in a rocker arm of a valve train assembly of internal combustion engines, said lifter comprising:

a cylinder having a cylindrical surface formed in said rocker arm;

a plunger reciprocably mounted in said cylinder in sliding contact with said cylindrical surface;

a seat member securely pressed in said cylinder above said plunger, said seat member defining a reservoir chamber and a pressure chamber in said cylinder and having an outer circumferential portion extending in contact with said cylindrical surface in a direction of said plunger;



a stopper means formed at an end surface of said outer circumferential portion of said seat member for restricting an axial movement of said plunger in a direction of said seat member; and

at least one relief recess means formed in said cylindrical surface above said stopper means for a finishing machining process of said cylinder whereby each recess means is completely covered by said outer circumferential portion of said seat member such that said cylindrical surface encircles said plunger and is formed by an uninterupted smooth sliding surface along the entire length of movement of said plunger.

4,624,225

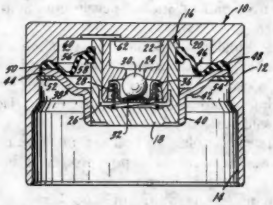
SELF-CONTAINED LASH ADJUSTER WITH DIAPHRAGM-TYPE SEAL

Steven J. Kowal, Prospect Heights, Ill., assignor to Stanadyne, Inc., Windsor, Conn.

Filed May 3, 1985, Ser. No. 730,195

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.58 **3 Claims**



1. A self-contained lash adjuster including a generally cylindrical cup-shaped follower, a lash adjuster cartridge assembly, a spacer mounting said cartridge assembly within said follower,

said cartridge assembly including a reciprocally movable body and a plunger within said body, a high pressure chamber defined between said plunger and body, a plunger passage opening into said high pressure chamber, a check valve controlling flow through said plunger passages,

and a diaphragm-type seal attached at its outer periphery to an interior wall of said follower and attached at its inner periphery to the movable body, an annular recess formed in the interior wall of said follower, the outer periphery of said diaphragm seal having an enlarger area positioned within said recess, with said spacer holding the outer periphery of said diaphragm seal and the enlarged area thereof in said recess, said diaphragm seal having a radial distance between its inner and outer peripheries on the order of about 1.5 to 2 times the radial distance between said body and follower interior wall spanned by said diaphragm, said diaphragm-type seal and follower interior wall defining a fluid reservoir, passage means connecting said reservoir with said cartridge assembly, movement of said body toward the plunger moving fluid from said cartridge assembly to said reservoir and causing a stretching of said diaphragm-type seal.

4,624,226

DEVICE FOR HEATING THE GLOW PLUGS OF INTERNAL COMBUSTION ENGINES

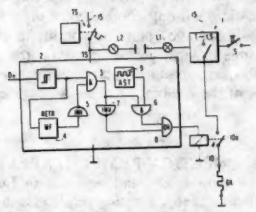
Roland Klak, Ostfildern, and Olaf Büchner, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,919

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342865

Int. Cl.⁴ F02P *19/02*

U.S. Cl. 123—179 H **3 Claims**



1. A device for controlling heating of glow plugs in a flame starting system of an internal combustion engine and causing the glow plugs, until a certain operating point is reached, to receive the maximum current, a temperature switch which allows a reduced current to be supplied to the glow plugs from this operating point until a predetermined engine temperature value is reached for supplying an operating voltage to said device, wherein said device includes

a retriggerable monostable time function element that is triggered to generate an output signal for a predetermined time period when a control voltage exceeds a certain value,

wherein the end of the predetermined time period of the retriggerable monostable time function element is the certain operating point, and

wherein the temperature switch closes below a certain first engine temperature value and opens above a second engine temperature value, and

wherein, via said temperature switch, the operating voltage for the device is switched on and off.

4,624,227

FOUR-STROKE INTERNAL COMBUSTION ENGINE WITH A LUBRICATING OIL PUMP

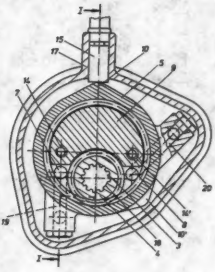
Peter Wünsche, Graz, Austria, assignor to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H., Graz, Austria

Filed Sep. 5, 1985, Ser. No. 772,906

Claims priority, application Austria, Sep. 21, 1984, 3012/84

Int. Cl.⁴ F02B *77/00*

U.S. Cl. 123—198 C **2 Claims**



1. In a four-stroke internal combustion engine which includes a crankshaft and lubricating oil pump, the improvement wherein said lubricating oil pump comprises a housing defining a pump body which has an outer periphery which conforms to an arc of a circle; an annular gearwheel rotatably mounted around said pump body, said annular gearwheel having an inner surface which includes gear teeth extending radially inwardly thereof and an outer surface which includes projections thereon, said projections functioning as valve control cams; and a driving pinion positioned within said annular gearwheel and between said pump body and said annular gearwheel, said driving pinion being connectable to the crankshaft of said engine and including external teeth thereon which mesh with the radially-inwardly extending teeth of said annular gearwheel; the driving pinion having half as many teeth as said annular gearwheel such that said annular gearwheel will rotate at half the speed of said driving pinion.

4,624,228

INTAKE SYSTEM FOR DIESEL CYCLE ENGINES

Masanori Sahara; Takumi Nishida; Osamu Sado, and Masaaki Kashimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 6, 1985, Ser. No. 741,961

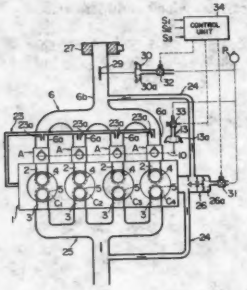
Claims priority, application Japan, Jun. 10, 1984, 59-85941[U]

Int. Cl.⁴ F02D *9/02*

U.S. Cl. 123—378 **18 Claims**

1. An intake system for diesel cycle engines comprising intake passage means leading through intake port means to combustion chamber means, timing valve means provided in said intake passage means in the vicinity of said combustion chamber means, control means for normally closing said timing valve means in a predetermined period of an intake stroke wherein the intake port means is opened to said combustion

chamber means and for opening said timing valve means in the remaining period of the intake stroke, and gas drawing means



opening to said intake passage means upstream of the timing valve means.

4,624,229

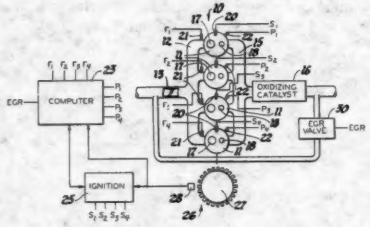
ENGINE COMBUSTION CONTROL WITH DILUTION FLOW BY PRESSURE RATIO MANAGEMENT

Frederic A. Matekunas, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1985, Ser. No. 792,676

Int. Cl.⁴ F02P *5/14*

U.S. Cl. 123—425 **15 Claims**



1. A combustion control for an internal combustion engine of the type having a combuation chamber, a rotating crankshaft, ignition apparatus for the combustion chamber and diluent gas flow control apparatus comprising, in combination:

means responsive to combustion chamber pressure to generate signals for a combustion event indicating combustion pressure and motored pressure at a predetermined crankshaft rotational angle when combustion is substantially complete;

means effective to compute, from the signals, a final pressure ratio of combustion pressure to motored pressure at the predetermined crankshaft rotational angle when combustion is substantially complete;

means effective to adjust the diluent flow to maintain the final pressure ratio at a predetermined level, whereby diluent flow is optimally controlled.

4,624,230

METHOD AND APPARATUS FOR DETERMINING THE FULL-LOAD LIMIT OF AN INTERNAL COMBUSTION ENGINE

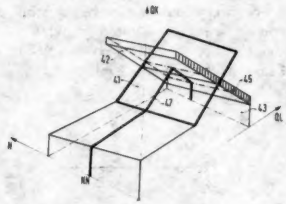
Hermann Grieshaber, and Hermann Kull, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,702

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, 3400513

Int. Cl.⁴ F02D *41/30*

U.S. Cl. 123—445 **1 Claim**



1. Method for determining the full-load limit of an internal combustion engine with a predeterminative full-load field of characteristics which is at least two-dimensional and which determines the dependence of the maximum mass of fuel to be supplied to the engine from at least the rotational speed thereof, the method comprising the step of influencing only one specific region of the full-load field of characteristics for adapting a plurality of said engines to each other, predeterminative full-load field of characteristics consisting of a plurality of predeterminative planes and determining the dependence of said maximum mass of fuel on the rotational speed of the engine and on the mass of air delivered to the engine, said specific region to be influenced being one of said predeterminative planes; and, determining said predeterminative planes by means of specific operating conditions of the internal combustion engine, said specific operating conditions being the maximum permissible exhaust gas temperature, the maximum permissible combustion pressure, and specific compositions of the exhaust gases of the internal combustion engine.

4,624,231

FUEL INJECTION PUMPING APPARATUS

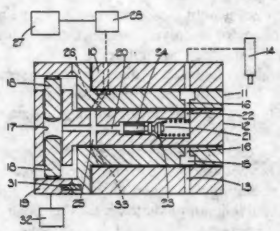
Ivor Fenne, Greenford, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Nov. 14, 1983, Ser. No. 551,251

Claims priority, application United Kingdom, Dec. 8, 1982, 8234945

Int. Cl.⁴ F02M *39/00*

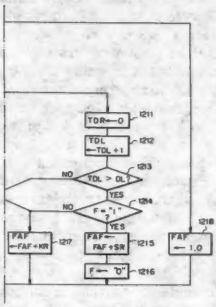
U.S. Cl. 123—450 **5 Claims**

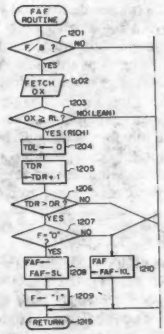


1. A fuel injection pumping apparatus for supplying fuel to multi-cylinder internal combustion engines of the compression

ignition type, the apparatus comprising an injection pump operated in use, in timed relationship with an associated engine, a rotary distributor member having a delivery passage communicating with the injection pump and arranged to register in turn as the distributor member rotates, with a plurality of outlets during successive delivery strokes of the injection pump, a delivery valve in said delivery passage, a sleeve member surrounding the distributor member, said sleeve member defining said outlets and being movably mounted to be angularly adjustable about the axis of rotation of the distributor member, an adjustable cam ring forming part of the injection pump which is movably mounted and operable to vary the timing of delivery of the fuel by the injection pump, means coupling said sleeve member to said cam ring for moving said sleeve in correspondence with adjustment of said cam ring whereby the positional relationship between said cam ring and said sleeve remains essentially constant throughout the range of adjustment of said cam ring, a further passage opening onto the periphery of the distributor member for registration with said outlet ports in turn and a restricted orifice in said further passage, said passage registering with an outlet following the registry therewith of the delivery passage, said orifice acting to damp the reflected wave produced by closure of the valve member in the associated nozzle.

(f) adjusting an amount of fuel to be supplied to said engine in accordance with said calculated air-fuel ratio correction amount so that the air-fuel ratio of said engine approaches a predetermined value.





4,624,232

APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Kimitaka Saito; Kenzi Iwamoto, both of Nishio; Hideki Obayashi, Okazaki, and Takeshi Matuyama, Nukata, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 22, 1985, Ser. No. 757,846

Claims priority, application Japan, Jul. 23, 1984, 59-153789

Int. Cl.[4] F02M *51/00*

U.S. Cl. 123—489 **21 Claims**

1. An apparatus for controlling the air-fuel ratio in an internal combustion engine having an exhaust pipe, comprising:

air-fuel ratio sensor means, provided in said exhaust pipe, for sensing a concentration of a specific component of the exhaust gas of said engine and providing an output signal corresponding thereto; and

control means for (a) determining whether or not the output signal of said air-fuel ratio sensor means is larger than a reference voltage, (b) calculating a differential waveform of said output signal with respect to time, (c) detecting a degree of functional deterioration of said air-fuel ratio sensor means by using successive measurements of said differential waveform of said output signal over a predetermined period of time, (d) controlling an air fuel ratio feedback control value in accordance with the detected degree of functional deterioration of said air-fuel ratio sensor means, (e) calculating an air-fuel ratio correction amount in accordance with the reference voltage determination of the output signal of said air-fuel ratio sensor means and said air-fuel ratio feedback control value, and

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4,624,233

FUEL PUMPING APPARATUS

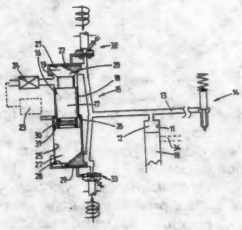
Ronald Phillips, Northolt, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Jul. 10, 1985, Ser. No. 753,374

Claims priority, application United Kingdom, Jul. 13, 1984, 8417863

Int. Cl.[4] F09M *39/00*

U.S. Cl. 123—506 **6 Claims**



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a pumping plunger reciprocable within a bore, said plunger when inward movement is imparted thereto displacing fuel from a pumping chamber

defined in part by the inner end of the bore, an outlet communicating with the pumping chamber said outlet in use being connected to an injection nozzle of the associated engine and valve means operable to allow fuel to escape from said pumping chamber during the inward movement of the plunger thereby to control the amount of fuel which flows through said outlet, said valve means comprising a valve member movable into contact with a seating to prevent escape of fuel from said pumping chamber, said valve member being held in contact with said seated by the pressure of fuel in said pumping chamber while fuel is being supplied through said outlet, resilient means for biasing said valve member away from the seating, a piston member slidable in a cylinder, one end of said cylinder being connected to said pumping chamber, said cylinder having an end wall at said one end thereof, said piston member and said end wall when the piston member is in contact with the end wall defining a closed recess, two way valve means operable to connect said recess to a low pressure source or to said one end of the cylinder, the arrangement being such that during delivery of fuel through said outlet, when said two way valve means is operated to connect said recess to said one end of the cylinder the piston member will move in said cylinder away from said end wall, means whereby the motion of the piston member will be transmitted to said valve member to lift the valve member from the seating thereby to allow fuel to escape from said pumping chamber, further resilient means biasing the piston member towards said end wall, said valve means including a head engageable with the seating, the head in the open position of the valve engaging an end wall of a cylinder housing the valve member, a recess defined between the head of the valve member and the last said end wall when said valve member is in the open position, and further two way valve means operable to connect said last named recess with the pumping chamber when it is required to close the valve.

4,624,234

ELECTRONIC IGNITION TIMING ADJUSTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

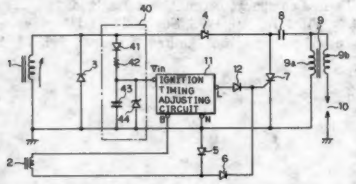
Hisakazu Koketsu; Toshihiro Saga, both of Kariya; Toshitaka Yamada, Nagoya; Tiaki Mizuno, Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 20, 1985, Ser. No. 713,681

Claims priority, application Japan, Mar. 21, 1984, 59-54769; Nov. 21, 1984, 59-247248; Dec. 20, 1984, 59-270282; Dec. 21, 1984, 59-271556

Int. Cl.[4] F02P *3/04, 5/155*

U.S. Cl. 123—602 **11 Claims**



1. An electronic ignition timing adjusting system for an internal combustion engine for operating the engine with electronically adjusted ignition timing, said ignition timing adjusting system comprising:

(1) a magneto-type generator driven by said internal combustion engine;

(2) a constant voltage circuit energized by the output of said generator for producing a constant voltage output;

(3) angular position detecting means for detecting first and second angular positions of a crank shaft of said engine and generating first and second corresponding detection signals respectively;

(4) an advance angle computing circuit connected to said angular position detecting means and said constant voltage circuit for receiving said corresonding detection signals and for producing an electronically computed ignition timing signal in relation to said corresponding detection signals and said constant voltage output from said constant voltage circuit;

(5) an advance angle adjusting circuit connected to said constant voltage circuit for detecting said constant voltage output from said constant voltage circuit and for cancelling said electronically computed ignition timing signal when said constant voltage output from said constant voltage circuit is lower than a voltage which is an absolute minimum voltage necessary for the accurate computation of ignition timing.

4,624,235

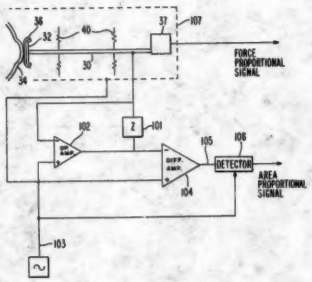
FORCE-TRIGGERED APPLANATION TONOMETER

Albert C. Krabacher, Lakewood, Colo., and George J. Eilers, 31537 Broadmoor Dr., Evergreen, Colo. 80439, assignors to George J. Eilers, Evergreen, Colo.

Filed Apr. 13, 1984, Ser. No. 599,967

Int. Cl.[4] A61B *3/16*

U.S. Cl. 128—652 **9 Claims**



1. An applanation tonometer for ascertaining the internal hydrostatic pressure of a flexible body containing a fluid, said body subject to curvature due to said internal hydrostatic pressure, comprising

(a) a footplate comprising a planar portion for bearing against said flexible body, a shaft for supporting said footplate and a guard electrode spaced apart from said footplate and substantially surrounding said footplate,

(b) housing means for supporting said footplate in a housing, said housing means capable of displacement toward said body whereby a portion of the surface of said flexible body is flattened against against said footplate,

(c) force sensing means for ascertaining the magnitude of the force exerted by said body against said footplate and for generating a force proportional signal,

(d) area signal generating means for developing a signal proportional to the area of said flexible body in contact with said footplate comprising oscilator means for driving both said footplate and said guard electrode to the same a.c. potential,

(e) comparator means responsive to said force proportional signal means for establishing the equality or excess of said force proportional signal with respect to a threshold value of selectable magnitude for generating a trigger signal,

(f) scaling means responsive to said trigger signal for operating on the instantaneous signal magnitude of said area proportional signal with a quantity dependent upon said force proportional signal to obtain a pressure value, and

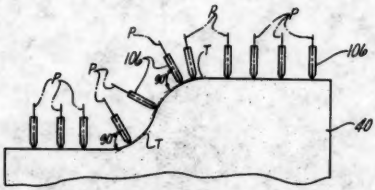
(g) display means to indicate said pressure value.

4,624,236

ORTHOGONAL DRESSING OF GRINDING WHEELS

Richard H. Gile, North Clarendon, Vt., and Edward C. Bourgoine, Claremont, N.H., assignors to Ex-Cell-O Corporation, Troy, Mich.

Division of Ser. No. 645,373, Aug. 29, 1984. This application Nov. 27, 1985, Ser. No. 802,148
Int. Cl.[4] B24D 53/00
U.S. Cl. 125—11 R 2 Claims



1. An electro-mechanical system for dressing a grinding wheel carried on first and second slide means and a rotatable dresser having a working section for dressing the grinding wheel in a desired wheel contour comprising computer means for providing first and second sets of linear slide position data together representing movement of the grinding wheel in a path corresponding substantially to the desired wheel contour and for providing a third set of rotary dresser position data representing angular movement of the dresser with movement of the grinding wheel on the wheel contour path to maintain a reference plane through the dresser working section substantially orthogonal to a reference plane containing a tangent to the wheel contour path at locations thereon, first and second electric motor driven screw actuator means connected to the respective first and second slide means for driving the slide means in a sequence to move the grinding wheel along the desired wheel contour path in contact with the dresser, electric motor means for continuously rotating the dresser, servo means for interfacing said computer means and said electric motor driven screw actuator means and dresser rotary means, said servo means including first and second slide position feedback means for the respective first and second slide means and a dresser rotary position feedback means for the dresser for controlling the linear movement of the first and second slide means and rotary movement of the dresser to effect dressing of the wheel contour with a reference plane through the dresser working section maintained substantially orthogonal to a plane containing a tangent to the wheel contour path during the dressing operation.

4,624,237

DIAMOND SAW

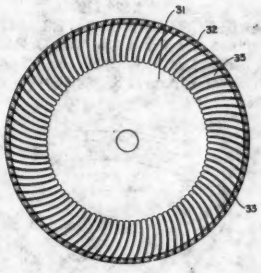
Jiro Inoue, 6-5 303, Kami Tsuruma 5-chome, Sagamihara-shi, Kanagawa, Japan

Continuation-in-part of Ser. No. 618,577, Jun. 8, 1984, abandoned. This application Feb. 28, 1985, Ser. No. 706,875
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.[4] B28D 1/04
U.S. Cl. 125—15 11 Claims

1. A diamond saw for cutting hard materials such as stone, rock or concrete, comprising:

a support disc made of steel having an outer periphery and a pair of side faces, a plurality of corrugations being provided in each of said side faces; and,

an abrading body which is secured to said outer periphery of said support disc, said abrading body including a mixture of diamond abrasive particles and a metal bonding powder, a pair of side faces being provided on said abrading body with each side face having a plurality of grooves, said abrading body grooves coinciding with and communicating with recesses provided between said corrugations of said support disc, wherein the abrading body grooves are of the configuration of curved lines having optional directions, and the grooves are arranged almost radially so



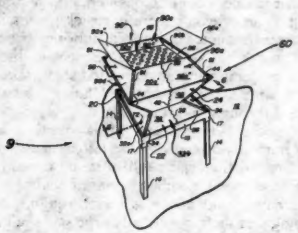
as to provide a resistance free passage for outflow of abraded particles of the cut hard material and an associated coolant thereby effectively dissipating heat generated by the saw.

4,624,238

DEVICE INTERCHANGEABLE AS AN OUTDOOR STOVE AND A TABLE

Paul W. Hait, Saratoga, Calif., assignor to Pyromid, Inc., Los Gatos, Calif.

Filed Dec. 3, 1984, Ser. No. 677,582
Int. Cl.[4] F24C 1/16
U.S. Cl. 126—9 R 17 Claims



1. A cooking unit comprising:

(a) a frame;

(b) a support member of pyramidal truncated configuration disposed on said frame, said support member having an open upper end;

(c) a firebox of an inverted pyramidal configuration disposed on said support member, said firebox having an open lower end, the lower end of aid firebox being in telescoping relation with the upper end of said support member to be supported thereby; and

(d) a pan disposed on said frame below said support member to provide a base for supporting said support member, said pan being formed with flanges along the perimeter thereof, said flanges being disposed downwardly to depend from said pan when said pan is used as a cover and as a suoport surface, and said flanges being disposed upwardly upstanding from said pan when said pan is used as a base for said support member,

(e) said support member comprising panels having trapezoidal configurations and adjacent non-parallel edges of said panels being hingedly connected for folding and extending said support member,

(f) said firebox comprising panels having trapezoidal config-

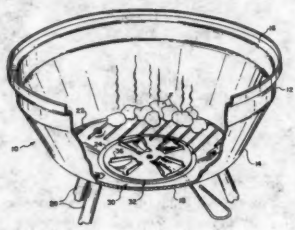
urations and adjacent non-parallel edges of said panels of said firebox being hingedly connected for folding and extending said firebox.

4,624,239

BARBECUE GRILL DAMPER-ASH RAKE

Bernard Yellin, 6 Oak Brook Club Dr., Oak Brook, Ill. 60521

Filed Dec. 4, 1985, Ser. No. 804,446
Int. Cl.[4] A47J *37/00*; F24B *3/00*
U.S. Cl. 126—25 R **5 Claims**



1. A barbecue grill comprising:

an open-topped receptacle having a planar section in a bottom wall thereof, said planar section having a plurality of vent openings and a central mounting opening formed therein;

a flat disc rotatably mounted on said planar section in face-to-face contact therewith, said disc having a plurality of damper openings formed therein operationally cooperable with said vent openings;

central hub means depending from said disc rotatably mounted in said mounting opening, said hub means comprising a pair of ears integrally struck from said disc;

handle means mounted from said hub means beneath said planar section for selectively rotating said disc, said handle means comprising an elongated shaft, said ears being formed with a pair of opposed holes, said shaft being mounted through said holes; and

resilient means between said planar section and handle means normally urging said disc into intimate contact with said planar section, said resilient means comprising a bent spring steel metal member having a central opening accommodating said hub ears therethrough, said member engaging said shaft to normally urge said shaft away from said planar section.

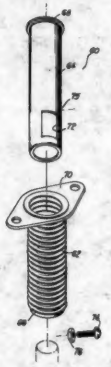
4,624,240

UNIVERSAL GAS BURNER WITH DUAL ADJUSTABLE FLEXIBLE VENTURI TUBE ASSEMBLY FOR GAS-FIRED BARBECUE GRILLS

Robert J. Hitch, Columbus, Ga., assignor to W. C. Bradley Company, Columbus, Ga.

Continuation-in-part of Ser. No. 672,470, Nov. 19, 1984. This application Aug. 23, 1985, Ser. No. 769,162
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—41 R **5 Claims**

1. A flexible and length adjustable gas/air feeder venturi tube assembly for connecting a gas burner element with gas controls on diverse types of gas fired barbecue grills, said assembly comprising a flexible conduit section having a substantially flat mounting flange secured to one end thereof, a straight cylindrical substantially rigid venturi tube section engaged with the flexible conduit section, said flexible conduit section having a reduced diameter cylindrical sleeve extension on one end thereof telescopically and slidably receiving said venturi section therein, a flange on one end of the venturi tube section of somewhat larger diameter than the diameter of said sleeve extension but smaller than the internal diameter of said flexible conduit section, air inlet means on said venturi tube section near the end thereof away from said flexible conduit section, and a spoiler means disposed on and extending into



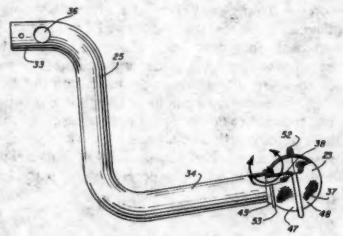
said venturi tube section, away from said air inlet means, for promoting intermingling of the gas with the air stream entering said air inlet means.

4,624,241

REFLECTOR FOR RADIANT HEATER

John T. Cherryholmes, Potwin, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Continuation-in-part of Ser. No. 576,035, Feb. 1, 1984, Pat. No. 4,569,329. This application Aug. 7, 1985, Ser. No. 763,207
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—92 B **3 Claims**



1. A radiant heater combining a base, a reflector mounted on the base, the reflector including a curved reflecting wall having a focal point, a burner tube mounted on the base and extending through an opening in the reflector, a burner head on the end of the burner tube, a pair of spaced-apart elongated mounting members mounted on the base, slide means mounted on each mounting member and being movable along a portion of the length of the mounting member for slidably supporting the reflector, and pivot means mounted on each of the slide means for pivotally supporting the reflector whereby the reflector is pivotably mounted on the base to permit tilting movement of the reflector relative to the burner head and the slide means are movable along the spaced-part elongated mounting members to permit movement of the curved reflecting wall of the reflector and the focal point thereof toward and away from the burner head so that radiant heat energy from the burner can be focused and dispersed by the reflector wall, the reflector including a parabolic rear reflecting wall and a pair of flat sidewalls, said means for pivotally mounting the reflector

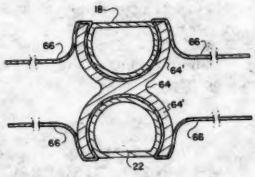
providing a pivoting axis for the reflector which extends through the sidewalls forwardly of the parabolic rear wall.

4,624,242

SOLAR HEAT TRANSFER AND STORAGE SYSTEM

Danny McCall, Hickory, N.C., assignor to Examplar, Hickory, N.C.

Filed Aug. 13, 1985, Ser. No. 765,141
Int. Cl.[4] F24J 2/42
U.S. Cl. 126—427 **21 Claims**



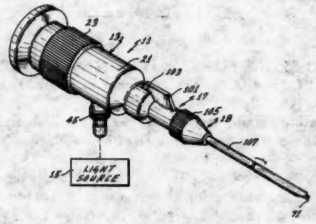
1. A heat transfer and storage system comprising:
(a) a heat storage chamber having a phase change material contained therein;
(b) water heater means for containing potable water, and including first conduit means through which said water flows, said first conduit means having a portion thereof extending through said phase change material in said chamber;
(c) means for collecting heat energy, and including second conduit means through which a heat transfer liquid flows, said second conduit having a portion thereof extending through said phase change material in said chamber in adjacent parallel relation to said portion of said first conduit means;
(d) fin means extending outwardly from said portions of said first and second conduit means to transfer heat between said conduit portions and said phase change material; and
(e) connecting means simultaneously holding said portions of said first and second conduit means in adjacent heat conducting relationship to one another and holding said fin means interposed between said portions of said first and second conduit means in a heat conducting relationship therewith.

4,624,243

ENDOSCOPE HAVING A REUSABLE EYEPIECE AND A DISPOSABLE DISTAL SECTION

Guy R. Lowery, Mira Loma; Said S. Hilal, Laguna Niguel; Richard F. Carson, Jr., Orange, and Danny L. Pastrick, Huntington Beach, all of Calif., assignors to American Hospital Supply Corp., Deerfield, Ill.

Filed Apr. 8, 1985, Ser. No. 720,590
Int. Cl.[4] A61B 1/06
U.S. Cl. 128—6 **28 Claims**



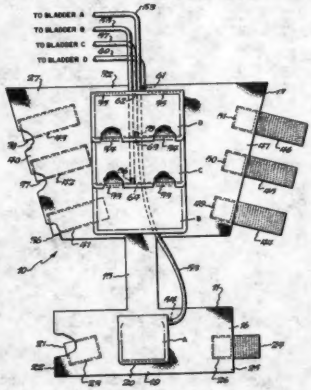
1. An endoscope comprising:
a reusable eyepiece assembly including a housing, first light-conducting means on the housing for conducting light to a first location and a second light-conducting means including a lens and a viewing port for conducting light from a second location to the viewing port, said first and second locations being located distally of the viewing port;
a disposable distal section including an elongated body adapted to be at least partially received within a patient and having proximal and distal ends, first light-conducting means carried by the body for conducting light from a first location distally to adjacent the distal end of the body and second light-conducting means carried by the body for conducting light from adjacent the distal end of the body proximally to a second location;
each of said first light-conducting means terminating substantially at the associated first locations and each of said second light-conducting means terminating substantially at the associated second locations;
at least one of said first locations and said second locations being alignable only in a predetermined angular position of the distal section and the eyepiece assembly; and
means for releasably mounting the distal section on the eyepiece assembly in said predetermined angular orientation so that said first locations are in general alignment and said second locations are in general alignment whereby light can be conducted between the distal section and the eyepiece assembly and the distal section can be removed from the eyepiece assembly and discarded after use without discarding the eyepiece assembly.

4,624,244

DEVICE FOR AIDING CARDIOCEPITAL VENOUS FLOW FROM THE FOOT AND LEG OF A PATIENT

Syde A. Taheri, 268 Dan Troy, Williamsville, N.Y. 14221

Continuation-in-part of Ser. No. 660,802, Oct. 15, 1984, abandoned. This application Jan. 18, 1985, Ser. No. 692,579
Int. Cl.[4] A61H 23/04; A61M 1/00
U.S. Cl. 128—24 R **16 Claims**



1. A portable device for aiding cardiocepital venous flow from the foot and leg of an ambulatory patient, said foot including an instep and an arch with soft tissue associated therewith and said leg including a calf with soft tissue associated therewith, said device comprising a first cuff for encircling the arch and instep of said foot, said first cuff comprising a first flexible substantially planar member having a first central portion and first outer edge portions, a first bladder of a size for placement substantially only in contiguous relationship to said soft tissue of said arch, means for securing said first bladder to said first central portion of said first cuff such that portions of said first flexible substantially planar member on opposite sides

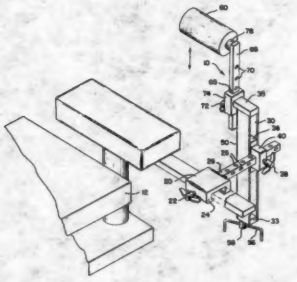
of said first bladder extend laterally beyond said first bladder with first spaces proximate said opposite sides of said first bladder, said first spaces being located between said portions of said first flexible substantially planar member and said arch to permit circulation in the flesh of said arch proximate said first spaces when said first bladder is inflated, a second cuff for encircling said leg, said second cuff comprising a second flexible substantially planar member having a second central portion and second outer edge portions, a plurality of sequentially ascending second bladders of a size for placement substantially only in contiguous relationship to said soft tissue of said calf for exerting pressure on the deep veins of the leg, means for securing said second bladders to said second central portion of said second cuff such that portions of said second flexible substantially planar member on opposite sides of said second bladder extend laterally beyond said second bladder with second spaces proximate said opposite sides of said second bladder, said second spaces being located between said portions of said second flexible substantially planar member and said leg to permit circulation in the flesh of said leg proximate said second spaces when said second bladders are inflated, first conduit means in communication with said first bladder, second conduit means in communication with said second bladders for effecting sequential inflation of said second bladders, first fastening means on said first outer edge portions for securing said outer edge portions relative to each other when said first cuff is placed in encircling engagement with said foot, and second fastening means on said second outer edge portions for securing said second outer edge portions relative to each other when said second cuff is placed in encircling engagement with said leg.

4,624,245

HIP DISPLACEMENT APPARATUS

Robert J. Mullin, 19711 Seppo St., Chatsworth, Calif. 91711, and Donald M. O'Sullivan, 2323 Union Ave., Westleyville, Pa. 16510

Filed Aug. 10, 1984, Ser. No. 639,462
Int. Cl.[4] A61G *13/00*
U.S. Cl. 128—75 **2 Claims**



1. A device of use with a stationary surface for laterally displacing a patient's femur from its normal position of engagement with the patient's hip comprising:

a mount for attachment to the stationary surface;

a member for exerting controlled pressure against the femur when said member is placed in a predetermined position in contact with the patient; and

an assembly for so moving said member relative to said mount that a sufficient amount of controlled pressure can be selectively exerted and maintained against the femur to laterally displace the femur from its normal position of engagement with the hip and said assembly being structured for so moving said member that said pressure can be selectively diminished, said assembly being structured to permit said member to be moved for exerting controlled pressure against the femur to accommodate a plurality of patient orientations;

wherein said assembly comprises a carriage adapted for such selective angular attachment to said mount that said member can be moved at a predetermined angle relative to said mount;

a guide movably connected to said carriage and having said member so mounted thereon that movement of said guide relative to said carriage moves said member at said predetermined angle relative to said mount;

a lead screw so threadably associated with said carriage and so connected to said guide that rotation of said lead screw moves said guide relative to said carriage;

means for rotating said lead screw; and

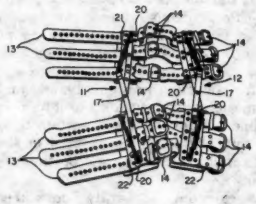
means for mounting said member to said guide, said mounting means being structured for extension relative to said guide.

4,624,246

KNEE-SUPPORTING BRACE

Krikor Ajemian, 1388 9th Ave., San Francisco, Calif. 94122

Filed Nov. 1, 1985, Ser. No. 794,062
Int. Cl.[4] A61F *3/00*
U.S. Cl. 128—80 C **7 Claims**



1. A knee-supporting brace to be fastened to a leg comprising a pair of structures which are adjustably and removably connected to each other, each of said structures including

an elongate upper member having top and bottom ends,

an elongate lower member having top and bottom ends and being rotatably connected to said upper member,

a first elastic means connected to said upper and lower members at positions near said top ends thereof, and

a second elastic means connected to said upper and lower members at positions near said bottom ends thereof,

said brace further comprising

upper strapping means which are secured to both said upper members of said pair of structures and serve to completely encircle a leg above a knee such that said upper members are adjustably fastened to said leg above said knee, and

lower strapping means which are secured to both said lower members of said pair of structures and serve to completely encircle said leg below said knee such that said lower members are adjustably fastened to said leg below said knee.

4,624,247

LEG BRACE FOR CONTROLLING SUBLUXATION

Edward L. Ford, Azle, Tex., assignor to Medical Designs, Inc., Azle, Tex.

Continuation-in-part of Ser. No. 693,143, Jan. 22, 1985, abandoned. This application Dec. 23, 1985, Ser. No. 812,008
Int. Cl.[4] A61F *3/00*
U.S. Cl. 128—80 C **6 Claims**

1. In a knee brace for alleviating problems with tibia rotation, subluxation and migration with respect to a femur of the wearer, characterized by:

a. first and second pairs of elongate braces with each of said braces being rotationally stiff so as to resist both torsion and bending forces; said first pair of braces being adapted

to lie on opposite sides of the wearer's thigh and said second pair of braces being adapted to lie on opposite sides of the wearer's calf;

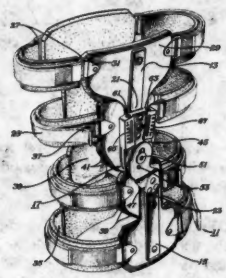
b. a pair of respective hinge means connected respectively with the first and second pairs of braces at their respective central ends for allowing and controlling flexion and extension of the wearer's leg, and

c. means for adjustably placing and holding respective pairs of elongate braces at desired attained positions on respective opposite sides of the wearer's thigh and calf with said hinge means positioned correctly adjacent the wearer's knee;

the improvement comprising:

d. a plurality of eight flexible, inelastic, non-metallic straps that are fully adjustable and adapted to fit any size leg;

e. a plurality of 16 attaching D-ring means for affixing respective straps, 8 said D-ring means being connected at the anterior of said braces above and below said hinges



and a plurality of 8 said D-ring means being connected at the posterior above and below said hinges; said D-ring means being connected with said braces and defining respective individual points for affixing said plurality of the 8 straps above and below said hinge means such that one size fits any leg, controls subluxation and distal migration and compensates for laxity of ligaments in the leg; and

f. a plurality of two contoured condyle pads on each side interiorly of each respective said hinge means, each pair of said two condyle pads allowing each segment of the leg to flex independently of the other without bunching either said condyle pad with respect to said condyle of either the tibia or the femur; said condyle pads being shaped, respectively, to fit the supracondylar regions of the tibia and femur, respectively, such that they support the condyle regardless of flexion or extension of the tibia with respect to the femur; said pads being disposed interiorly of and respectively connected with said straps and said pairs of braces for comfort of the wearer.

4,624,248

TRANSPARENT PRESSURE GARMENT

Forrest R. Poole, Worcester, and David G. Hansen, Sterling, both of Mass., assignors to David Clark Company Incorporated, Worcester, Mass.

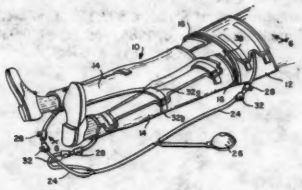
Continuation of Ser. No. 464,662, Feb. 7, 1983, Pat. No. 4,531,516. This application Apr. 8, 1985, Ser. No. 720,585

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—89 R **6 Claims**

1. A modular pressure garment comprising: three separate transparent exterior panels, three separate transparent interior panels, each of said interior panels being joined peripherally to a respective one of said exterior panels to form three separate inflatable chambers, the exterior panels having at least some of their peripheral portions extending beyond the peripheries of their associated interior panels, one of said exterior panels being dimensioned and configured to be operatively applied at a position encircling the abdomen of the wearer, and each of the other two of said exterior panels being dimensioned and configured to be operatively applied at a position encircling a leg of the wearer; each of the thus operatively applied exterior



panels having its associated interior panel facing inwardly and having overlapping peripheral portions, the transparency of said interior and exterior panels providing a substantially unhindered view therethrough; means for detachably interconnecting the overlapping peripheral portions of said exterior panels; and means for inflating said chambers.

4,624,249

ORTHOPEDIC EXTERNAL FIXING APPARATUS

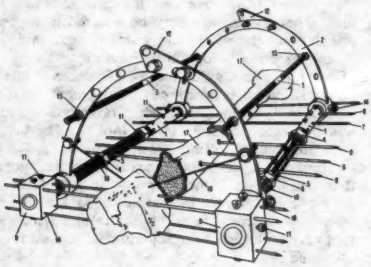
Rodrigo J. Alvarez Cambras, Havana, Cuba, assignor to Medicuba, Havana, Cuba

Filed Feb. 4, 1985, Ser. No. 697,849

Claims priority, application Cuba, Dec. 4, 1984, 36222

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 ZK **4 Claims**



1. An orthopedic external fixation device for positioning fragments of a bone, comprising,

structural means for positioning the bone, said structural means having a plane of symmetry at which the bone is generally positioned, said structural means including

two spaced, generally parallel bars each including a solid section and a tubular section having an outer surface forming threads, said solid and said tubular sections having a plurality of spaced first and second holes, respectively,

a pair of pistons connected to said solid sections slidably mounted in said tubular sections, said pistons having a plurality of spaced third holes capable of being aligned with said second holes,

a plurality of spaced transfixing pins extending through the bone and positioned in said first, second, and third holes aligned in a plane normal to said plane of symmetry,

nut means threadably mounted to said threads of said tubular sections for locking said transfixing pins extending through said second holes, and

stop means for preventing transverse movement of said pins through the bone fragments and the first, second, and third holes.

4,624,250

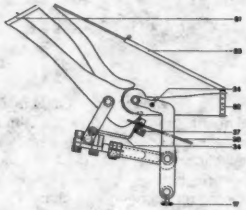
INSTRUMENT FOR ELBOW SURFACE REPLACEMENT ARTHROPLASTY

Gerald A. B. Saunders, Sydenham, and Charles Sorbie, Kingston, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation-in-part of Ser. No. 507,378, Jun. 24, 1983. This application May 6, 1985, Ser. No. 730,931

Int. Cl.[4] A61F 5/04

U.S. Cl. 128—92 VY 9 Claims



1. An orthopaedic bone positioning and tool guiding device comprising:

(a) adjustable clamping means for transverse pivotal mounting on the epicondyles adjacent the distal end of a humerus;

(b) extensible arm means mounted on said clamping means and extending longitudinally therefrom, including means to lock said arm means at a selected length;

(c) transversely mounted adjustable and lockable means at the free end of said arm means, including means to adjustably mount transverse and longitudinal bone securing pins, whereby an ulna may be secured in a preselected orientation relative to said humerus and said clamping means is secured in operative position;

(d) first cutting tool guide means, of selected radial length, pivotally mountable for arcuate movement, on the medial side of said clamping means operatively secured to said humerus into which a cutting tool may be inserted for accurate arcuate cutting of said humerus;

(e) second cutting tool guide means of greater radial length than said first guide means, pivotally mountable for arcuate movement, on the medial side of said clamping means operatively secured to said humerus into which a cutting tool may be inserted for accurate arcuate cutting of said ulna; and

(f) planar cutting tool guide means mountable on the lateral side of said clamping means operatively secured to said humerus so as to provide a guide for a planar oscillating cutting tool for accurate planar cutting of a radial bone.

4,624,251

APPARATUS FOR ADMINISTERING A NEBULIZED SUBSTANCE

Nicholas C. Miller, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Sep. 13, 1984, Ser. No. 650,096

Int. Cl.[4] A61M 16/00

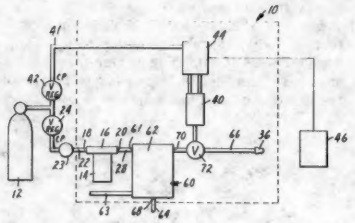
U.S. Cl. 128—200.14 1 Claim

1. A device for delivering a metered dose of a substance, comprising:

means for providing a supply of gas under pressure,

nebulizing means for generating an aerosol of said substance, said nebulizing means defining a through opening having an inlet and an outlet, said inlet being coupled to said supply of gas,

administration means for affording continuous and constant flow of gas through said nebulizing means and for affording administration of said aerosol to a subject, said administration means comprising a mixing chamber having first and second inlets and first and second outlets, said first inlet coupled to the outlet of said nebulizing means, a second means connected to said second inlet for providing a second supply of gas under pressure to said mixing chamber, an exhaust means coupled to the first outlet of said mixing chamber and open to the atmosphere which causes continuous and constant flow of gas through said nebulizing means, a delivery means coupled to said second outlet of said mixing chamber and; adapted to be coupled to the breathing passageway of a subject to permit administration of said aerosol to said subject, and valve means in



said delivery means having parts relatively moveable between normally closed and open positions for controlling the passage of the aerosol through said delivery means,

activating means for causing said valve means to permit passage of the aerosol through said delivery means for a predetermined period, after which said activating means returns said valve means to its normally closed position such that passage of aerosol through said delivery means is prevented.

4,624,252

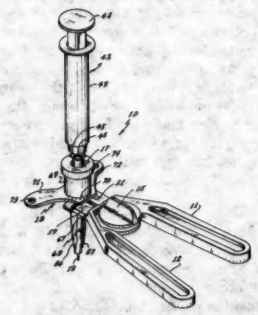
SURGICAL DEVICE

Sol Weiss, 17227 Quesan Pl., Encino, Calif. 91316

Filed Feb. 14, 1985, Ser. No. 701,916

Int. Cl.[4] A61B 17/32

U.S. Cl. 128—305.3 1 Claim



1. In a surgical instrument including a holder for a stylet wherein said holder includes a pair of extension portions having said stylet held therebetween and having a generally semi-circular opening therethrough and a straight needle half secured to each extension portion extending down from said semi-circular opening and each of said needle halves having an inner groove terminating at their terminal ends in sharp edges, each of said grooves being aligned with its respective semi-circular opening so that, when said extension portions abut against each other, said needle halves form a generally circular channel communicating at one end with the exterior of said

extension portions and at the other end with said sharp edges, said stylet including a straight hollow needle extending downwardly between said needle halves, the improvement which comprises:

said stylet needle extending below the terminal ends of said needle halves when said stylet is retained between said extension portions, said needle terminating in a sharp end having a bulged portion abutting against the terminal ends of said needle halves so that fluid cannot flow between said sharp end and said terminal ends, said needle halves having cooperating means thereon adjacent said terminal ends preventing fluid flow through said needle halves when said needle is removed from between said needle halves, said cooperating means including one of said needle halves having a concave portion therein between said extension portion and said terminal end adjacent said terminal end and the other of said needle halves having a convex portion therein between said extension portion and said terminal end adjacent said terminal end, said convex portion mating with said concave portion to seal off fluid flow.

4,624,253

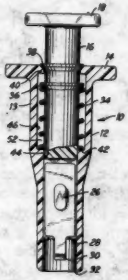
LANCET

James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 18, 1985, Ser. No. 692,750

Int. Cl.[4] A61B *17/34*

U.S. Cl. 128—314 **7 Claims**



1. A lancet assembly comprising,

(a) an elongated housing;

(b) a passage extending through said housing with a lancet opening at one end thereof;

(c) an elongated lancet body reciprocable in said passage;

(d) a lancet blade positioned in said lancet body at one end thereof;

(e) actuation means on said lancet body at the end thereof opposite said lancet blade;

the improvement characterized by

(f) a plurality of spaced apart first integral abutment means on said housing and extending into said passage;

(g) a plurality of spaced apart second integral abutment means on said lancet body for cooperating with said first abutment means;

(h) resilient means extending between said lancet body and said housing;

(i) whereby pushing said actuation means causes said lancet body to move through said passage in a first direction causing one of said second abutment means to move past one of said first abutment means causing a snap-action in a puncture direction and in turn causing said lancet blade to move through said lance opening;

(j) said first movement compressing said resilient means and damping said snap-action;

(k) said first movement stopped by cooperation of said actuation means with said housing; and

(l) release of said actuation means causing relaxation of said resilient means and movement of said lancet body in said passage in a non-puncture direction until engagement of one of said second abutment means with one of said first abutment means for maintaining said lance blade within said housing in a non-contaminating position.

4,624,254

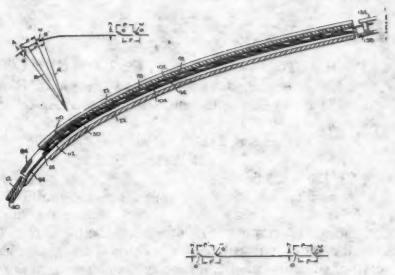
APPARATUS FOR APPLYING SURGICAL CLIPS

Richard A. McGarry, Norwalk, and Douglas G. Noiles, New Canaan, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 349,584, Feb. 17, 1982, Pat. No. 4,509,518. This application Jan. 22, 1985, Ser. No. 693,203

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—325 **9 Claims**



1. A ratchet for moving surgical clips along a path at least a portion of which is longitudinally curved comprising:

an elongated body which can be flexed into the shape of the path;

a plurality of teeth having clip engaging portions for conveying said surgical clips along said path, said teeth associated with one side of the body, the teeth being divided into sets with the distance the teeth project from the body, when the body is uncurved, varying between the sets to accommodate the curved portion of the path so that when the body is flexed into the shape of the path, the teeth of the various sets project from the body to approximately the same extent, notwithstanding the curve.

4,624,255

APPARATUS FOR ANASTOMOSING LIVING VESSELS

Robert R. Schenck, 1100 N. Lake Shore Dr., Chicago, Ill. 60611, and Harry P. Weinrib, 2644 W. Estes Ave., Chicago, Ill. 60645

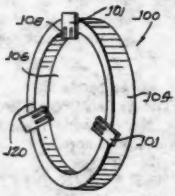
Continuation of Ser. No. 548,867, Sep. 29, 1983, abandoned, which is a continuation of Ser. No. 349,885, Feb. 18, 1982, Pat. No. 4,474,181. This application May 14, 1985, Ser. No. 734,389

Int. Cl.[4] A61B *17/11*

U.S. Cl. 128—334 R **12 Claims**

1. Apparatus for anatomosing a first living vessel of an external diameter having a prepared end and an open first passageway therein to a second living vessel having a second passageway and a prepared opening, the apparatus comprising a substantially encircling anastomosis member of biocompatible material, at least three suture holding means attached to said encircling member in a detachable manner at each of three circumferentially spaced connecting locations, a suture held by each of said suture holding means, and a needle pre-attached to each of said sutures, whereby said encircling member may be prepackaged in a sterile manner along with said pre-attached sutures and needles positioned at said connecting locations and whereby said pre-attached sutures and needles are used during

surgery to join the end of the first vessel and the second vessel to said encircling member at said connecting locations with the end of the first living vessel stretched radially outward to tend the same and to assist in holding the end of the first vessel in



sealing apposition against the second vessel, said encircling member being sufficiently rigid to maintain its shape while serving as the sole support of said joined vessels connected thereto.

4,624,256

CAPROLACTONE POLYMERS FOR SUTURE COATING

Kenneth A. Messier, Jewett City, and Joseph D. Rhum, Old Lyme, both of Conn., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Sep. 11, 1985, Ser. No. 774,636
Int. Cl.[4] A61L *17/00*
U.S. Cl. 128—335.5 **8 Claims**

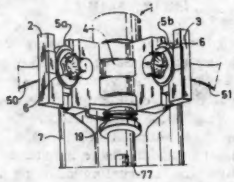
1. A surgical suture comprising a braided multifilament of poly(glycolic acid or a copolymer containing at least 85% glycolic acid units coated with a lubricating agent selected from the group consisting of a high molecular weight homopolymer of caprolactone, a high molecular weight copolymer of at least 90% by weight of caprolactone and the remainder another biodegradable monomer, and a blend of at least 50% by weight of said homopolymer of said copolymer of caprolactone and up to 50% by weight of another biodegradable lubricating agent, said homopolymer or copolymer of caprolactone having a melt viscosity at 60° C. of at least about 50,000 centipoise or being solid.

4,624,257

SURGICAL INSTRUMENT FOR PERFORMING ANASTOMOSIS

Anders Berggren, Bergdalsgatan 6, Linkoping s-582 45; Hakan A. E. Rohman, Vitsippestigen 4, Mantorp s-590 20, and Leif T. Ostrup, Onkel Adamsgatan 10, Linkoping s-582 35, all of Sweden

PCT No. PCT/SE83/00253, § 371 Date Feb. 21, 1984, § 102(e) Date Feb. 21, 1984, PCT Pub. No. WO84/00102, PCT Pub. Date Jan. 19, 1984
PCT Filed Jun. 17, 1983, Ser. No. 588,100
Claims priority, application Sweden, Jun. 24, 1982, 8203966
Int. Cl.[4] A61B *17/04, 17/08*
U.S. Cl. 128—334 C **35 Claims**



32. A surgical instrument for joining portions of generally cylindrical organs, such as blood vessels, and establishing connection between them (i.e. anastomosis) by using at least two couplable fasteners, each of which is selectively connectable to one of said portions to be joined, comprising:

(a) a carrier rod;

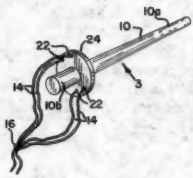
(b) at least two clamping means for securing and retaining said fasteners, said clamping means mounted on said carrier rod for relative rotation around said carrier rod, said clamping means being rotatably movable around the axis of said rod, such that the two clamping means move towards and away from each other between a first position for receiving said fasteners and a second position for coupling said fasteners.

4,624,258

CERVICAL DILATOR WITH CAPTIVE EXTRACTION ELEMENT

George Stubbs, Los Angeles, Calif., assignor to Milex Products, Incorporated, Chicago, Ill.

Filed Sep. 11, 1984, Ser. No. 649,504
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—341 **12 Claims**



1. A cervical dilator assembly comprising:

a generally longitudinally tapered rod-shaped dilating element configured for insertion into the cervical canal, said element having the property of undergoing substantial radial expansion when in contact with fluids normally present in or adjacent said canal;

substantially non-expandable collar means having an aperture through which said dilating element extends wherein said collar means is captively secured around a portion of said dilating element in the unexpanded state of said rod-shaped element with portions of said element axially extending forwardly and rearwardly past both sides of said collar means, the expansion of said dilating element forwardly and rearwardly of said collar means resulting from said contact with said fluids securely anchoring said collar means thereto; and

hand grippable means affixed to said collar means for allowing a pulling force to be applied directly to said collar means so as to withdraw said dilating element from the cervical canal when said element is in said expanded state on both sides of said collar means.

4,624,259

FULL BODY TANNING APPARATUS

Glenn Welt, 1117 Perimeter Cir. West, Suite N122, Atlanta, Ga. 30346

Filed Jan. 9, 1985, Ser. No. 689,912
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—396 **24 Claims**

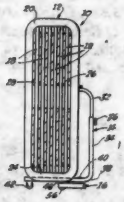
1. A portable tanning system for providing tanning rays towards a user comprising:

a canopy for holding a plurality of bulbs of a type providing ultraviolet light, said canopy having a wire receptacle for receiving wires and a path therein for coupling said received wires to said bulbs, said canopy having an open front end and a heat pervious material covering said back;

a base, including at least one ballast for said bulbs and means to connect said ballast to a source of household current, said base also including a wire outlet, said base further

including feet means thereunder positioned to allow said base to be freestanding at an angle other than vertical with respect to the ground; and

connecting means of a hollow lightweight material connected to said base for connecting said canopy wire recep-



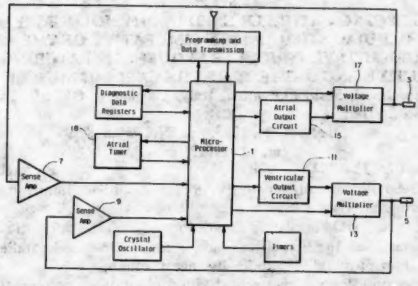
tacle to said base wire outlet and, when in an operating position, for holding said base in a vertical position with respect to the ground and for holding said canopy in an adjustable position to provide said tanning rays towards said user.

4,624,260

PACEMAKER WITH CONDITIONAL ATRIAL TRACKING CAPABILITY

Ross G. Baker, Jr.; Richard V. Calfee; Richard S. Sanders, all of Houston; Joe Vandegriff, Freeport, all of Tex., and Jay Warren, Placerville, Calif., assignors to Intermedics, Inc., Angleton, Tex.

Filed May 7, 1985, Ser. No. 731,581
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **21 Claims**



14. A method for operating a dual chamber heart pacemaker, comprising the steps of:

detecting electrical signals in the atrium and ventricle of a heart;

pacing the ventricle in response to atrial signals which occur at a rate less than a predefined atrial rate limit; and

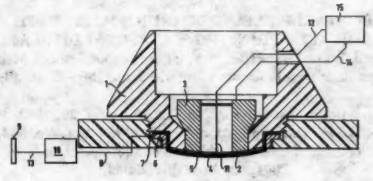
pacing the atrium at a predefined time following each paced or sensed ventricular signal, unless an atrial signal is detected within a predefined atrial rate limit interval preceding said time, in which case the atrial pace is skipped.

4,624,261

ELECTROCHEMICAL MEASURING CELL HAVING AN ANCILLARY ELECTRODE

Uvo Hölscher, Stockelsdorf, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,995
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432950
Int. Cl.[4] A61B *5/04*; G01N *27/52*
U.S. Cl. 128—635 **5 Claims**



1. An electrochemical measuring cell comprising:

an electrolyte;

a measuring electrode disposed in said electrolyte;

a counter electrode also disposed in said electrolyte;

a housing for holding said electrolyte;

a diffusion and sensing member including a diffusion membrane for separating said electrolyte from the ambient and having an outer surface facing away from said electrolyte; and, a coating applied to said outer surface of said diffusion membrane for sensing an external electrical potential, said coating being electrically conductive and permeable to gas; and,

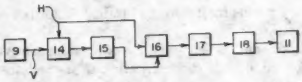
electric circuit means mounted on said housing for conducting said external potential away from said coating and making the same accessible for measurement.

4,624,262

APPARATUS AND PROCESS FOR VERY RAPIDLY MEASURING THE HEART BEAT RATE

Henri Berger, 90 Bld de Latour Maubourg, 75007 Paris, and Didier Lapeyre, Pacy sur Eure, both of France, assignors to Henri Berger, Paris, France

Filed Nov. 26, 1984, Ser. No. 674,922
Claims priority, application France, Nov. 25, 1983, 83 18856
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—689 **4 Claims**



1. An apparatus for very rapidly, externally measuring the heart beat rate of a patient comprising:

a housing having a tip portion to which is mounted a slightly bulging contact piece extending beyond said housing for being placed in direct contact with the wrist blood pressure point of the patient;

at least one dynamometer located in said housing tip which receives mechanical input signals when said contact piece is placed in operative contact with the pressure point of the patient and thereby transfers the contact to said dynamometer which converts said mechanical input signals to electrical signals with a force that is relatively constant and less than the force created by the systolic pressure of the blood flow in the radial artery of the patient;

detection means connected to said dynamometer output for detecting the maxima of the said dynamometer signals;

computing means connected to said detection means for providing an electrical signal indicative of the heart beat rate, said computing means comprising:

means for determining two maxima,

means for calculating the period T separating two maxima,

means for calculating the inverse of said period, and

means for converting said inverse period to a time unit and for providing the result at an output thereof; and

visual, numeric display means for displaying said result as a number.

4,624,263

PORTABLE ELECTROCARDIOGRAPH WITH DIGITALLY-PRINTING WAVEFORM DISPLAY

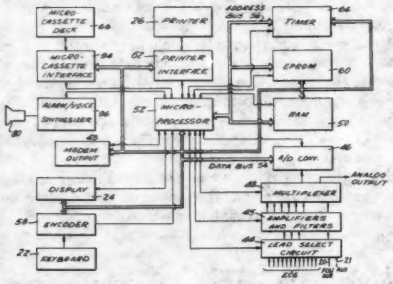
Martin J. Slavin, Dix Hills, N.Y., assignor to Advanced Medical Electronics Developments Limited Partnership, White Plains, N.Y.

Continuation-in-part of Ser. No. 526,260, Aug. 25, 1983, Pat. No. 4,483,346. This application Aug. 24, 1984, Ser. No. 643,620

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—710 41 Claims



1. An electrocardiograph for connection to sensors outputting analog electrical signals, comprising:

at least one sensor outputting analog electrical signals;

sampling means for selectively sensing at intervals at least one analog signal representative of the analog signals from at least one of said sensors;

analog to digital conversion means for receiving said sampled analog signals and outputting digitized signals corresponding thereto;

memory means including a plurality of addresses for storage of data therein;

processor means for writing said consecutively sampled digitized signals representative of a predetermined duration of the at least one analog sensor output signal into said addresses of said memory means for storage therein in consecutive order;

printer means for recording on a print medium in response to digital data input thereto, said processor means including reading means for reading said stored data from said addresses in said memory means in said consecutive order and input said data to said printer means for printing a series of portions of a curve representative of the analog signal from said at least one sensor, said printer means including medium advance means for moving said print medium after printing each said curve portion, a cardiogram of said predetermined duration of said selectively sensed at least one analog signal being produced on said print medium extending in the direction of advance of said print medium; and

case means for carrying said sampling means, analog to digital conversion means, memory means, processor means and printer means, said case means and contents being dimensioned and of a weight to be conveniently hand held for ease or portability.

4,624,264

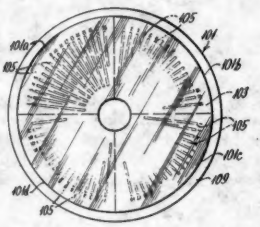
METHOD OF EARLY DETECTION OF BREAST CANCER

Zsigmond L. Sagi, Denville, N.J., assignor to B.C.S.I. Laboratories, Inc., New York, N.Y.

Division of Ser. No. 103,587, Dec. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 408,154, May 22, 1978, Pat. No. 4,190,058. This application Dec. 14, 1981, Ser. No. 330,501

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—736 2 Claims



1. A method of early detection of abnormalities in the body by comparison of the skin temperature of an area on one side of the body with that of a corresponding area on the other side, which comprises applying to the said areas two temperature sensors, each having temperature indicators which melt at predetermined temperatures to display a change in appearance, the indicators in each sensor being arranged in a pattern to form an array substantially covering the area of skin of temperature to be sensed, the patterns of the indicators of the arrays being comparable and the several indicators in one array having melting temperatures different from each other but identical with comparable indicators in the other array to facilitate temperature comparison of the two areas, and bringing the indicators into conforming contiguous contact with said area by pressing the indicators thereagainst by applying pressure thereto through a backing comprising a substantial thickness of a flexible compressible material.

4,624,265

ELECTRO-CATHETER USED IN PHYSIOLOGICAL CARDIAC STIMULATION SIMULATIVE OF THE AURICULO-VENTRICULAR SEQUENCE, FEATURING ACTIVE ENGAGEMENT OF THE CARDIAC MUSCLE

Gino Grassi, Sesto Fiorentino, Italy, assignor to GE. SV. IN. S.R.l., Italy

Filed Jul. 24, 1985, Ser. No. 758,518

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—784 6 Claims

1. An electro-catheter for physiological cardiac stimulation, which comprises:

a first flexible insulating sheath formed of a bio-compatible material, the first sheath having first and second parallel bores formed longitudinally therethrough;

a second flexible insulating sheath formed of a bio-compatible material, the second sheath having a third bore formed longitudinally therethrough, the third bore of the second sheath being in communication with the first bore of the first sheath;

first and second conductors, each conductor being spirally wound to define an internal bore, the first conductor being received by the first bore of the first sheath and the third bore of the second sheath, the second conductor being received by the second bore of the first sheath;

a first electrode, the first electrode being electrically con-

nected to the second conductor and mounted near one end of the first sheath for placement in the atrium of a patient;

a second electrode, the second electrode being electrically connected to the first conductor and mounted near one end of the second sheath for placement in the ventricle of the patient; and

first anchoring means mounted on the first electrode for anchoring the first electrode to a muscle wall of the

atrium, the first anchoring means including a spiral hook of conductive bio-compatible material, the spiral hook including a free end having a sharpened point, and means for pivoting the spiral hook radially with respect to the second sheath from a first position, wherein the hook is partially wrapped around the second sheath in close contact to the periphery thereof, to a second position, wherein the hook extends outwardly from the second sheath to expose the pointed free end thereof.

4,624,266

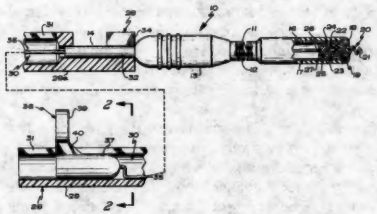
INTRODUCER TOOL FOR SCREW-IN LEAD

Lawrence M. Kane, Roseville, Minn., assignor to Daig Corporation, Minnetonka, Minn.

Filed Dec. 19, 1983, Ser. No. 562,830

Int. Cl.⁴ A61N *1/05*

U.S. Cl. 128—785 **7 Claims**



1. An introducer tool and styet in combination with an intravascular lead formed of a material inert to body fluids and adapted to be connected to a body tissue, said lead including an electrically insulated flexible coil conductor having a lumen therethrough and having proximal and distal ends, a connector pin electrically connected to the proximal end of the conductor and a hollow electrode connected to the distal end of the conductor and adapted to contact the body tissue, a helix assembly in the electrode including a non-conductive sealing member engaging the interior of the electrode, a helical element secured to the sealing member and projecting therefrom, the helix assembly being shiftable from a retracted position wherein the helical element is disposed completely within the electrode, and an extended position wherein the helical element projects outwardly of the electrode,

said introducer tool comprising an elongated body having a longitudinally extending opening therethrough and detachably engaging said connector pin to secure the introducer tool to the lead but permitting rotation of the later relative to the introducer tool;

said stylet comprising an elongated wire-like member having proximal and distal ends and being inserttable into the opening in the introducer tool and the lumen of the conductor and engaging the helix assembly and non-rotatably shifting the same in a longitudinal direction from the retracted position to the extended position, cooperating means on said stylet and said introducer tool permitting longitudinal insertion and retraction of the stylet relative to the introducer tool, but locking the stylet against rotation relative to the introducer tool whereby when the helix assembly is in the extended position and the conductor, electrode and helix assembly are rotated as a unit about the stylet, the helix assembly will penetrate the cardiac tissue and urge the electrode into positive engagement with the tissue.

4,624,267

CIGARETTE MANUFACTURE

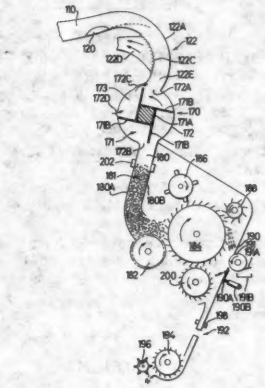
Francis A. Labbe, Paris, France, assignor to Molins PLC, London, England

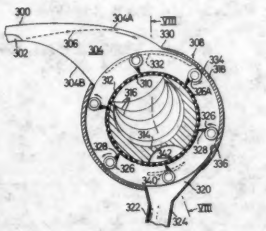
Division of Ser. No. 453,900, Dec. 15, 1982. This application May 17, 1985, Ser. No. 735,263

Claims priority, application United Kingdom, Apr. 16, 1981, 8112090

Int. Cl.⁴ A24C *5/39*

U.S. Cl. 131—108 **11 Claims**





11. A hopper for a cigarette making machine for use with a continuous tobacco feed, comprising substantially parallel downwardly-extending walls defining a channel for receipt through the upper end thereof of a continuous supply of tobacco forming a relatively thick carpet of tobacco; a roller at the lower end of the channel arranged to convey the carpet of tobacco from the channel at a variable speed towards a spiked conveyor of which the spikes have a tobacco-carrying capacity greater than the tobacco feed rate existing when the roller

rotates at its maximum speed; and means for receiving the tobacco fed by the spiked conveyor and for forming a relatively thin carpet of tobacco, said spiked conveyor being adapted to convey the tobacco along a predetermined path at the end of which the tobacco is removed from said spiked conveyor by a picker roller to form said relatively thin carpet of tobacco.

4,624,268

SMOKING ARTICLES

Richard R. Baker, Southampton; Frederick J. Dashley, New Milton; Anthony D. McCormack, Bournemouth, and Colin C. Greig, Salisbury, all of England, assignors to British-American Tobacco Company Limited, London, England

Filed May 2, 1984, Ser. No. 606,360

Claims priority, application United Kingdom, May 17, 1983, 8313604

Int. Cl.[4] A24D *1/02*

U.S. Cl. 131—332 **12 Claims**

1. A smoking article comprising a smoking-material rod enwrapped in a wrapper paper comprising at least one hydroxide compound and at least one organic compound of the group consisting of lithium hydroxide, aluminum hydroxide, calcium hydroxide, potassium formate, sodium formate and sodium acetate, at a total loading level of the compounds of not less than two g/m^2, whereby the total particulate matter (TPM) in the sidestream-smoke emanating from the lit end of said article during the smoking thereof is reduced by at least 30% in relation to the TPM which emanates from the lit end of an otherwise identical smoking article comprising conventional wrapper paper and smoked under the same smoking conditions.

4,624,269

CHEWABLE TOBACCO BASED PRODUCT

Larry D. Story, and Luther B. Pittman, both of Owensboro, Ky., assignors to The Pinkerton Tobacco Company, Owensboro, Ky.

Filed Sep. 17, 1984, Ser. No. 651,295

Int. Cl.[4] A24B *13/00, 13/02*

U.S. Cl. 131—352 **13 Claims**

1. A composition of matter comprising in combination

tobacco in an amount of 15.5% by weight of the composition;

a masticatory in an amount of 75.2% by weight of the composition and including a mixture of butyl rubber and microcrystalline wax;

a flavoring; and

a sweetener.

4,624,270

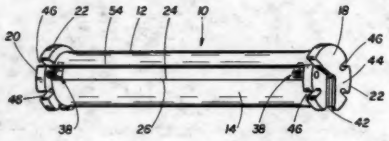
HAIR CURLER

H. L. Hinton, 31 S. Sheridan Rd., Louisville, Ky. 40220, and Albert J. Harden, Jr., 303 Beckley Woods Dr., Louisville, Ky. 40223

Filed Oct. 12, 1984, Ser. No. 660,073

Int. Cl.[4] A45D *2/12*

U.S. Cl. 132—39 **16 Claims**



1. A hair curler comprising:

a hollow, generally cylindrical housing having a first semi-cylindrical section and a second semi-cylindrical section, the first and second semi-cylindrical sections being closable together in registered concavely facing relationship;

hinge means interconnecting one longitudinal edge of the first semi-cylindrical section to one longitudinal edge of the second semi-cylindrical section; and,

the free edge of the first semi-cylindrical section having an elongated resilient lip overlapping the free longitudinal edge of the second semi-cylindrical section with an interference fit therebetween and exerting a generally radial force against the free longitudinal edge of the second semi-cylindrical section when the first and second semi-cylindrical sections are in the closed relationship establishing a liquid tight seal therebetween.

4,624,271

HAIR CURLING SYSTEM

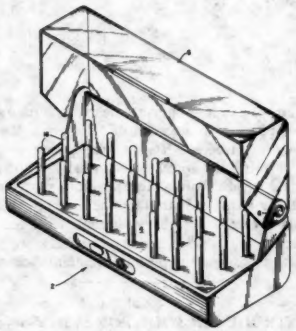
Lai Kin, Kowloon, Hong Kong, assignor to Windmere Corporation, Hialeah, Fla.

Continuation-in-part of Ser. No. 503,181, Jun. 10, 1983, Pat. No. 4,564,033. This application May 17, 1984, Ser. No. 611,338

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.[4] A45D *2/02*

U.S. Cl. 132—39 **28 Claims**



1. A hair curling roller system comprising:

a housing;

a plurality of post members arranged within said housing and being capable of generating heat in hair rollers placed on said post members, all of said post members of said system being of substantially the same diameter;

a plurality of rollers for curling hair, each of said rollers having an inner core means with an axially extending inner cavity, an outer surface for contact with hair to be rolled and a metal sleeve arranged within said inner cavity;

a first group of said plurality of rollers having a first outer diameter along their center section of their outer surface and a second group of said plurality of rollers having a second outer diameter along their center section of their outer surface with said second outer diameter being larger than said first outer diameter, each of said rollers of both of said groups of rollers having said axially extending inner cavity extending from an opening at one end of said roller and said metal sleeves arranged inside of said inner cavities of all of said rollers having substantially the same inner diameter, each of said rollers being capable of being arranged on one of said post members such that said post member extends into said metal sleeve of the respective said roller;

said core means of each of said rollers of said second group of rollers including heat transfer means for facilitating the transfer of heat from its said inner cavity to its said outer surface so that when said rollers are heated the level of heat on the outer surface of all of said rollers is approximately the same.

4,624,272

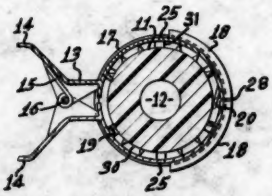
HAIR CURLING DEVICE

Peter R. Franzino, Jacksonville, Fla., assignor to Zip Clip, Inc., Jacksonville, Fla.

Continuation of Ser. No. 504,446, Jun. 15, 1983, abandoned, which is a continuation of Ser. No. 352,851, Feb. 26, 1982, abandoned. This application Nov. 22, 1985, Ser. No. 800,989

Int. Cl.[4] A45D *2/00*

U.S. Cl. 132—40 14 Claims



1. A hair curling spool holder for releasable attachment about a heatable elongated cylindrical spool onto which hair is wrapped therearound with upstanding hair engaging nibs on its outer surface and an outwardly extending flange at each end, the improvement comprising a pair of mating half sections having a respective finger grip, each said section including an elongated narrow portion generally parallel to the longitudinal axis of an elongated spool and a centrally located narrow transverse portion joining said elongated narrow portion to its said finger grip, said half sections being pivotally joined together adjacent said finger grips adapted to open and close said narrow portions along a longitudinal line to be respectively removed from or closely encircle an elongated spool, said half sections having spaced open ends to substantially expose therethrough the ends of an elongated spool clamped therebetween, said holder having pairs of internally projecting opposing prongs spaced along said longitudinal line, said opposed pairs of prongs being connected internally of said elongated narrow portions of said sections for providing lateral locking engagement with each other to close said holder around an elongated spool and to engage the hair of a user without damage thereto.

4,624,273

PIGMENTED COMPOSITION

Raymond Carr, Devon, England, assignor to Atlas Pencil Company Limited, Devon, England

Filed Nov. 13, 1984, Ser. No. 670,922

Claims priority, application United Kingdom, Nov. 11, 1983, 8330201

Int. Cl.[4] A45D *40/26*

U.S. Cl. 132—88.7 21 Claims

1. A pigmented or coloured composition which when mixed with water forms a set product adapted to be transferred to the skin as a cosmetic, the composition comprising a pigment or colouring material, plaster of paris and a material having a laminar structure, the composition containing from about 30 to about 75 wgt % plaster of paris.

4,624,274

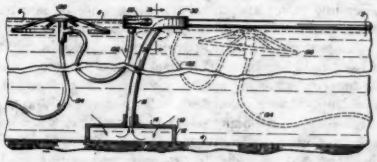
POOL CLEANER SWIVEL APPARATUS

Rickie E. Norton, 1421 E. Garnet, Mesa, Ariz. 85204

Filed Jun. 24, 1985, Ser. No. 747,896

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—111 6 Claims



1. Cleaning apparatus for an above-ground swimming pool having a pool bottom and water in the pool, comprising, in combination:

water inlet housing means adapted to be disposed on the pool bottom;

a water vacuum hose connected to the water inlet housing means and extending upwardly to the top of the water in the pool;

cleaning head means floating on the top of the water in the pool and movable randomly in the pool; and

swivel means at the top of the water in the pool, including

housing means disposed about the water vacuum hose,

first connection means for connecting the housing means to a first water supply hose,

a ring movable in the housing means relative to the housing means and to the water vacuum hose, and

second connection means on the ring for connecting a second water supply hose to the cleaning head means for supplying water to the cleaning head means.

4,624,275

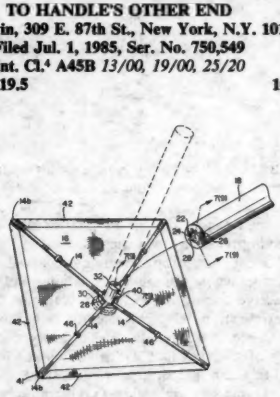
EMERGENCY UMBRELLA WITH HEAD MOUNTABLE TO HANDLE'S OTHER END

Blair F. Baldwin, 309 E. 87th St., New York, N.Y. 10128

Filed Jul. 1, 1985, Ser. No. 750,549

Int. Cl.[4] A45B *13/00, 19/00, 25/20*

U.S. Cl. 135—19.5 10 Claims



1. An umbrella comprising:

a hollow tubular handle including a first end formed with an opening and a second, opposite closed end having an umbrella mounting aperture therein;

a hub having an enlarged end with a lateral dimension greater than said umbrella mounting aperture, and a generally cylindrical shaft extending from said enlarged end and insertable within said umbrella mounting aperture;

a plurality of ribs, each having a web support end and an opposite hub mounting end hingedly secured to said hub to provide pivotal movement of each said rib only between an opened position in which said ribs are positioned substantially perpendicular to said shaft and a closed position in which said ribs are substantially coaxial with and adjacent to said shaft;

a web of flexible, water resistant material connected to said hub and said web support ends of said ribs,

key means associated with one of said hub and said umbrella mounting aperture;

key receiving means associated with the other of said hub and said umbrella mounting aperture for matingly engaging with said key means to permit locking of said hub to said handle when said shaft is inserted and rotated within said umbrella mounting aperture, whereby the closed end of said handle biases said ribs to said opened position; and

said hub, ribs and web being so dimensioned that when said ribs are in said closed position, said hub, ribs and web can be inserted into said handle through the opening in the first end so as to fit entirely within said handle with only said enlarged end of said hub protruding therefrom.

4,624,276

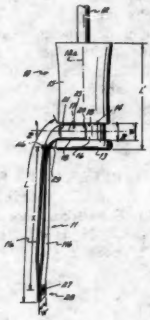
UMBRELLA HANDLE

James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio

Continuation-in-part of Ser. No. 322,859, Nov. 19, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,606

Int. Cl.[4] A45B *25/00*

U.S. Cl. 135—20 R **13 Claims**



1. An umbrella having a cover, a rib structure for erecting and collapsing said cover, and a centerpost, the improvement comprising

an umbrella handle having an exterior surface and a strap receiving recess formed therein,

a flexible carrying strap having a connected end and a free end, at least a part of said strap defining a closed loop sized to receive one or more of a user's fingers therethrough,

said flexible strap being permanently connected at said connected end to said handle in said recess, said flexible strap being of a length and width sufficient to allow a user's hand to grasp said strap loop when said strap swings free for carrying said umbrella by said strap when desired by a user and to fit within said recess substantially flush with said exterior surface in a stowed position when desired by a user where the other end of said strap does not swing free, and

holding means at least partially carried by at least one of said recess and said strap, said holding means cooperating with said strap to fasten said strap in said recess so as to be substantially flush with said exterior surface in said stowed position.

4,624,277

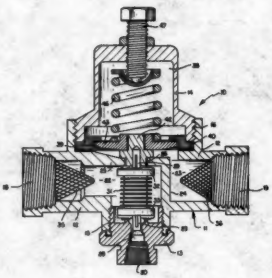
PRESSURE REGULATING AND RELIEF VALVE

Harry Veite, 5678 Tree Moss La., North Ridgeville, Ohio 44039

Filed Oct. 3, 1985, Ser. No. 783,573

Int. Cl.[4] G05D *16/06*

U.S. Cl. 137—116.3 **11 Claims**



1. A valve for supplying fluid at a rate between 20 and 1,000 standard cubic feet per hour, comprising:

a body having a first fluid passage, a second fluid passage communicating with the first fluid passage, a pressure relief passage communicating with the first and second fluid passages, and an ambient chamber vented to an ambient pressure;

a compressible bellows located in the first fluid passage, the bellows capable of sealing the first fluid passage from the second fluid passage, the bellows also capable of sealing the first fluid passage from the pressure relief passage;

a diaphragm separating the second fluid passage and the ambient chamber;

a connecting member located in the second fluid passage adjacent to the first fluid passage and attached to the diaphragm, the connecting member capable of engaging the bellows to seal the second fluid passage from the pressure relief passage; and

adjustable spring means biasing the diaphragm to urge the connecting member into sealing engagement with the bellows.

4,624,278

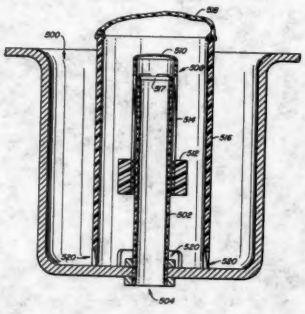
FLOW REGULATING DEVICE

John L. Delwiche, 316 California Ave., #520, Reno, Nev. 89509

Continuation-in-part of Ser. No. 291,355, Aug. 10, 1981, Pat. No. 4,458,714. This application Jul. 9, 1984, Ser. No. 628,749

Int. Cl.[4] F16K *31/22*

U.S. Cl. 137—172 **7 Claims**



1. An apparatus for regulating the flow of a first immiscible fluid and a second immiscible fluid through an aperture, the

first fluid having a specific gravity which is less than that of the second fluid, wherein the aperture is positioned in a scupper chamber, the apparatus comprising:

extension means having first and second communicating opened ends, the first end fixed about and surrounding the aperture so that the second end is positioned a predetermined distance from the aperture;

plug means coupled for movement relative to the extension means between an opened and a closed position, the plug means including a sealing surface for sealing the second end of the extension means whenever said plug means are in the closed position, wherein the plug means have a predetermined density such that the plug means float in the first fluid and sink in the second fluid and further wherein the plug means comprise a conduit shaped to be slideably coupled about the extension means, said conduit including apertures which permit communication between the interior and exterior of the conduit, said apertures being positioned in the conduit so that at least a portion of said apertures are positioned adjacent to the second end of the extension means when the plug means are in the opened position;

outer envelope means having opposing opened ends and defining a chamber, wherein the first end the outer envelope means is positioned about the aperture and so that the plug means and the extension means are enclosed within the chamber, the outer envelope means having apertures which connect the chamber to the exterior of the outer envelope means, wherein said apertures are positioned toward the first end of the outer envelope means; and

means for shielding the second end of the outer envelope means from the entry of the first or second fluids therethrough.

4,624,279

TUBE SEPARATOR WITH PROTECTION AGAINST CONTAMINATION

Hans Arens, Wertingen; Hans Kern, Vachendorf, and Richard Haslberger, Hufschlag, all of Fed. Rep. of Germany, assignors to Grunbeck Wasseraufbereitung GmbH, Fed. Rep. of Germany

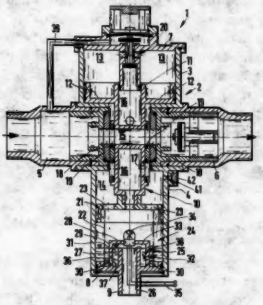
PCT No. PCT/EP83/00341, § 371 Date Aug. 14, 1984, § 102(e) Date Aug. 14, 1984, PCT Pub. No. WO84/02547, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 15, 1983, Ser. No. 642,673

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247320

Int. Cl.⁴ F16K *24/00*

U.S. Cl. 137—218 **8 Claims**



1. A tube separator comprising a housing with an inlet, an outlet, a separating chamber having a bottom plate and with a drain disposed in said bottom plate of said separating chamber, a shutoff member within said housing for connecting said inlet in a first position and for separating said outlet and connecting said outlet with said separating chamber in a second position, a compressing spring disposed in said separating chamber about the drain between said bottom plate and said shutoff member for urging said shutoff member into said first position and a water seal contained within said separating chamber for connecting said separating chamber with said drain, said water seal extending from said bottom plate into a portion of said separating chamber which is surrounded by said compression spring, thereby using a space within said compression spring for placing said water seal.

4,624,280

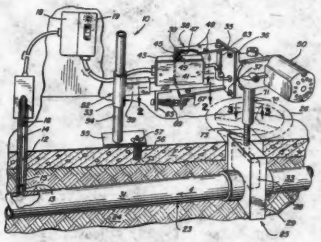
AUTOMATIC GATE VALVE SHUT-OFF DEVICE

Mario DePirro, 133 S. Westmore, Lombard, Ill. 60148

Filed Mar. 18, 1985, Ser. No. 712,423

Int. Cl.⁴ F16K *31/04*

U.S. Cl. 137—392 **6 Claims**



1. A system for automatically activating a gate valve of the type interposed in a pipe for alternately opening and closing the fluid path of a fluid traversing the pipe, the gate valve being positioned such as to divide the pipe into a forward exit section and a rear exit section, said system comprising in combination,

fluid sensing means positioned in the forward exit section of the pipe adapted to sense the fluid level within the pipe,

a two-phase motor having a forward phase and a reverse phase operationally associated with the gate valve for alternately opening and closing said gate valve thereby to open and close the fluid path traversing said pipe,

electrical means interconnecting said fluid sensing means and said motor thereby to activate said motor in response to the fluid level sensed by said fluid sensing means,

said motor including switch activation means associated therewith and both being mounted for arcuate movement about a pivot point,

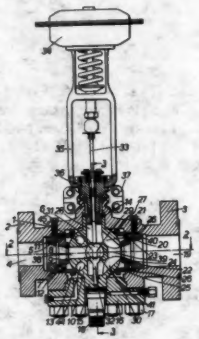
and switch means for alternately controlling the forward and reverse phases of said motor, said switch means being mounted and positioned in the arcuate path of travel of said switch activation means and said motor,

whereby a rise of the fluid level within the pipe would be sensed by said fluid sensing means and automatically electrically activate said motor to turn said gate valve into the closed position thereby to occlude the fluid path and seal the forward exit section of the pipe from the rear exit section thereof, the continued operation of the motor causing said motor and associated switch activation means to move arcuately about the pivot point thereby to move said switch means to simultaneously deactivate said motor and change the phase of said motor from the forward phase to the reverse phase, while a lowering of the fluid level in the pipe will similarly be sensed by said fluid sensing means and reverse each of the operations thereby to open said gate valve and deactivate the motor while simultaneously resetting the phase of said motor to the forward phase.

4,624,281
CONTROL VALVE

Jean E. Vidal, Enghien, and André L. Sério, Meudon, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Feb. 1, 1985, Ser. No. 697,366
Claims priority, application France, Feb. 3, 1984, 84 01658
Int. Cl.[4] F16K *11/12*
U.S. Cl. 137—599.2 4 Claims

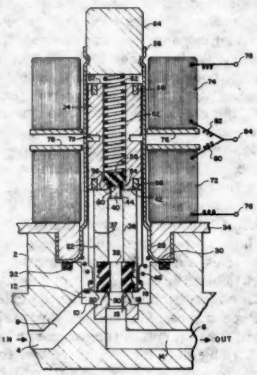


1. A control valve, comprising: a body (1) defining a fluid inlet line (4) and a fluid outlet line (19) coaxial with said fluid inlet line, and providing a fluid connection between said lines through at least one seat (29, 30); at least one closing member (31,32) for closing said seat; an operating rod (33) projecting from the body for moving said closing member along a rod direction perpendicular to said axial direction of said inlet and outlet lines, a spherical rotary member (10) provided within said body and rotatable around an axis of rotation oriented along said rod direction, said rotary member defining (a) a central hole (28) oriented along said axis of rotation and provided with said seat and permitting the passage of said operating rod and of said closing member, (b) a main inlet orifice (38), (c) a main outlet orifice (39), said main orifices being diametrically opposed along a first diameter perpendicular to said axis of rotation, (d) a main inner passage (40, 41) for connection between said main orifices and including said seat, (e) an auxiliary inlet orifice (42), (f) an auxiliary outlet orifice (43), said auxiliary orifices being diametrically opposed along a second diameter perpendicular to said axis of rotation and defining a common equatorial plane with said first diameter, and (g) an auxiliary inner passage (44, 45) completely separated from the main inner passage for connection between said auxiliary orifices, and, around each of said axial inlet and outlet lines, two leakproofing seals (9, 13; 24, 27) carried by said valve body, separated from each other and applied against said rotary member to ensure leakproofing between a fluid stream and an inside of said body in all positions of said rotary member, one (9,24) of each two leakproofing seals being individually located proximate an associated fluid inlet and fluid outlet line and another (13, 27) of each two leakproofing seals being sufficiently individually spaced from an associated fluid inlet and fluid outlet line so that leakproofing between the fluid stream and the inside of the body is ensured in all positions of the rotary member in which communication is established between one of the fluid inlet and outlet lines and one of the main and auxiliary inlet and outlet orifices, the arrangement being such that, in a first angular position of said rotary member, said main inlet and outlet orifices (38, 39) are respectively opposite said fluid inlet and outlet lines, control being effected by means of said operating rod, and such that, in a second angular position of said rotary member, said auxiliary inlet and outlet orifices (42, 43) are opposite said fluid inlet and outlet lines, control being effected by adjustment of said second angular position of said rotary member.

4,624,282
TWO-STAGE SOLENOID VALVE

Richard N. Fargo, Newington, Conn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 1, 1985, Ser. No. 697,599
Int. Cl.[4] F16K *31/06*
U.S. Cl. 137—599.2 11 Claims



1. A two-stage solenoid valve comprising
a fluid orifice defining a first fluid channel,
a first sealing means having a second fluid channel extending therethrough and coaxially aligned with said first fluid channel,
a first armature means attached to said sealing means and having a first movable armature with a third fluid channel extending therethrough and coaxially aligned with said second fluid channel in said sealing means,
a first solenoid coil means for selectively positioning said first armature in said first armature means to provide a spacing of said sealing means from said fluid orifice,
a second armature means having a second movable armature coaxial with said first armature,
a second sealing means movably confined by said second armature in said second armature means and aligned with an opposite end of said third fluid channel through said first armature from said first sealing means,
a second solenoid coil means for selectively positioning said second armature to provide a spacing of said second sealing means from said end of said third fluid channel,
a housing means for maintaining the coaxial relationship of said first and second armatures while defining a fourth fluid channel between said first armature and an inside surface of said housing means adjacent to said first armature,
a fixed stop means captured in said housing means,
a first resilient means located between said housing means and said first armature for urging said first sealing means against said fluid orifice to peripherally seal said fluid orifice and
second resilient means located between said stop means and said second sealing means for urging said second sealing means against said end of said third fluid channel to seal said end of said third fluid channel and said second armature against said first armature to maintain a first magnetic gap between said second armature and said stop means whereby an energized state of said second coil means is effective to oppose said second resilient means to withdraw said second sealing means from said third fluid channel to produce a first fluid flow state and to eliminate said

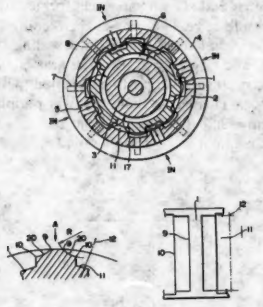
first gap between the second armature and said stop means while introducing a second magnetic gap between said first and second armatures and a concurrent energization of said first and second solenoid coil means is effective to oppose said first and second resilient means to withdraw said first sealing means from said orifice to produce a second flow state and to eliminate said first gap while maintaining a contact between said armatures and said second sealing means with said third fluid channel.

4,624,283

ROTARY CONTROL VALVE OF POWER STEERING SYSTEM AND METHOD OF PRODUCING SPOOL VALVE MEMBER

Takeshi Futaba, Yao, Japan, assignor to Koyo Auto-Mech. Co. Ltd., Kashihara, Japan

Filed Dec. 27, 1983, Ser. No. 565,556
Claims priority, application Japan, Dec. 27, 1982, 57-226781
Int. Cl.[4] F16K *11/12*; B62D *5/083*; F15B *9/10*
U.S. Cl. 137—625.24 **6 Claims**



1. A rotary control valve of a power steering system comprising:

a housing, a rotatable input shaft and a rotatable output shaft extending from said housing;

a torsion bar connecting said input shaft and said output shaft, a spool valve member having an axis and connected to and rotatable with the input shaft, said spool valve member being formed with axial grooves ;and

a valve body positioned within said housing and loosely rotatably receiving said spool valve member, said valve body secured to the output shaft and being formed with axial grooves corresponding to said axial grooves of said spool valve member for feeding and discharging the pressure fluid to and from said control valve when said axial grooves in said spool valve member are in communication with said axial grooves in said valve body;

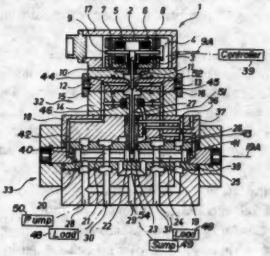
wherein the axial grooves of said spool valve member include control edges operative to effect control of the area of an opening defined by edges of the axial grooves of the spool valve member and the axial grooves of the valve body for feeding the pressure fluid and discharging same, the area of said opening controlled by the relative angular displacement of the spool valve member with respect to the valve body as the torsion bar is twisted by a load applied to the input shaft, to thereby control the flow rate of the pressure fluid through said control valve, said control edges extending parallel to said axial grooves of said spool valve member along substantially the entire length thereof and defined by at least one arcuate surface portion formed on said spool valve member at axially extending edges of said grooves, said arcuate surface portion having an axis extending parallel to the axial grooves of said spool valve member.

4,624,284

SERVOVALVE

Herbert Lembke, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jan. 24, 1985, Ser. No. 693,756
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3403015
Int. Cl.[4] F16K *11/07*
U.S. Cl. 137—625.62 **3 Claims**



1. A servovalve comprising:

a flow-control valve connectable between a source of fluid pressure and a load and having a steel spool defining an axis and displaceable therealong between an open position permitting fluid flow between the load and the source and a closed position axially offset therefrom and blocking such flow, the spool being formed with a radially open cylindrical bore having an inner steel surface;

a pilot valve having an impact plate and a pair of nozzles operatively axially oppositely effective on the spool and oppositely flanking the plate, whereby when the plate is closer to one of the nozzles than to the other the spool is axially displaced into one of its positions and when the plate is closer to the other nozzle the spool is urged axially oppositely;

a servomotor connected to the impact plate to move same between the nozzles;

a spring attached to the impact plate, extending generally radially of the spool axis, and having a free end projecting into the bore of the spool, the spring and axis defining a plane; and

a spherical corundum ball fixed to the free end of the spring, fitted in the bore, formed with two opposite flats lying in planes parallel to the plane of the spring and axis, and having an outer surface engageable with the inner surface of the bore.

4,624,285

CONTROL VALVE ASSEMBLY

Asi Perach, Buffalo Grove, Ill., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Continuation-in-part of Ser. No. 523,909, Aug. 16, 1983, Pat. No. 4,538,645. This application Jun. 3, 1985, Ser. No. 740,692
Int. Cl.[4] F16K *31/06*
U.S. Cl. 137—625.65 **11 Claims**

1. A control valve assembly of the type adapted to be operated at a high frequency with a variable duty cycle, the valve having an axis A-A, which comprises:

a housing having a cavity which extends axially within the housing, the housing further having

a first seat disposed in the cavity,

a second seat disposed in the cavity and spaced axially from the first seat leaving a control chamber therebetween.

a first port which adapts the valve assembly to be in fluid communication with a fluid at a first pressure, and which is in fluid communication through the first seat with the control chamber,

a second port which adapts the valve assembly to be in fluid communication with a region having a fluid at a second pressure which is not equal to the first pressure, and which is in fluid communication through the second seat with the control chamber,

a third port which is in fluid communication with the control chamber;

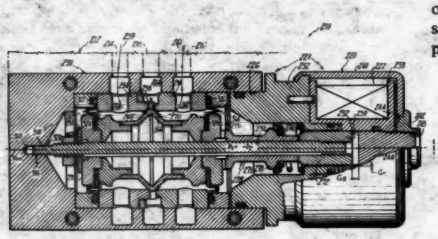
an integral armature having a first end and a second end, the armature extending axially about the axis Am, and being movable in a first direction to a first position and movable in a second direction to a second position, the armature having

a poppet disposed in the control chamber which is adapted to engage the first seat at the first position of the armature and to engage the second seat at the second position of the armature,

a plunger disposed in the cavity which is spaced axially from the poppet and which is spaced radially from the housing leaving a clearance gap Gr therebetween, and having an end spaced axially from the housing leaving an axial gap Ga therebetween, and

a shaft which extends axially from the plunger to the poppet through one of said seats to join the poppet to the plunger;

means for urging the poppet in one of said directions to engage one of said seats;



a coil extending circumferentially about at least a portion of the plunger for urging the poppet in the other of said directions to engage the other of said seats; and,

means for radially positioning the armature from the housing as the armature moves between the first seat and the second seat under operative conditions and for resisting movement of the armature in the radial direction which includes an annular diaphragm having an outer portion attached to the housing and having an inner portion attached to the armature at a location between the poppet and said first end of the armature, the diaphragm extending circumferentially about the axis Am between the armature and the housing to bound a flow path for fluid extending through the central chamber and to block the fluid from contacting said first end of the armature and the diaphragm extending axially to adapt the diaphragm to exert a centering force on the armature in response to the static pressure of the fluid as the poppet moves between the seats;

wherein forces exerted on the armature are transmitted to the poppet to move the poppet at high frequencies from the first seat to the second seat and from the second seat to the first seat to establish an average pressure in the control chamber which is a function of time spent at each seat and between the seats, and wherein the inertia of the plunger and the means for radially positioning the armature act to resist movement of the poppet in the radial direction in response to fluid forces acting on the poppet as the poppet moves between the seats.

4,624,286

DEGASIFYING VALVE FOR CONTAINERS

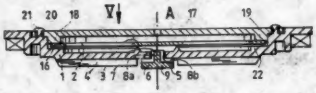
Walter Frohn, Geiselgasteigstrasse 100, D-8000 Munich 90, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,755

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 8411409[U]

Int. Cl.[4] F16K *15/14*

U.S. Cl. 137—859 **17 Claims**



1. A degasifying valve for storage and/or transport containers especially for storing and/or transportation of dangerous liquids, comprising a valve housing having a base provided with a degasifying orifice, the downstream mouth of said orifice being surrounded by a valve seat formed by at least one substantially knife-edge like ring-shaped endless rib, a diaphragm-like spring element biased into sealing contact with said valve seat and covering at least the area enclosed by said valve seat, and means for supporting the upper peripheral edge of said diaphragm element so that the lower peripheral edge of said diaphragm element is spaced from the valve housing to permit free movement at its peripheral edge.

4,624,287

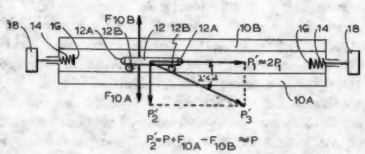
SHUTTLE UNIT OF A LOOM

Isaak Kakilashvili, and Shalva Kakilashvili, both of 62-32 99 St., Rego Park, N.Y. 11374

Filed Jun. 26, 1984, Ser. No. 624,731

Int. Cl.[4] D03D *49/44*

U.S. Cl. 139—134 **9 Claims**



1. A shuttle unit of a loom, comprising

a shuttle;

means forming a reversible electromagnetic field acting upon said shuttle so as to reciprocate said shuttle, said means including a reversible linear motor with an elongated stator having two ends and on which said shuttle moves, and a power supply for said reversible linear motor; and

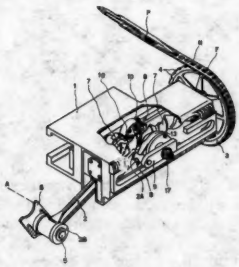
switching means for reversing said electromagnetic field, including a switch arranged on each end of said elongated stator, each of said switches including a winding connected therewith, and a sensing rod which is displaceable within said winding under the action of said shuttle so as to produce a magnetic field which actuates the position of the switch so as to reverse the electromagnetic field of said linear motor.

4,624,288

MECHANISM TO CONTROL THE MOVEMENTS OF WEFT INSERTION MEMBERS IN SHUTTLELESS WEAVING LOOMS

Luigi Pezzoli, Leffe, Italy, assignor to Vamatex S.p.A., Villa Di Serio, Italy

Filed May 31, 1985, Ser. No. 740,035
Claims priority, application Italy, Jun. 7, 1984, 21290 A/84
Int. Cl.[4] D03D *47/00*
U.S. Cl. 139—449 2 Claims



1. In a mechanism to control the movements of weft insertion members in the shed of shuttleless weaving looms of the type wherein a gearwheel controlling a gripper carrying strap is caused to rotate forward and backward by a variable pitch cam screw passing longitudinally through a slider which moves forward and backward along a rectilinear path; the improvement in which said slider carries means for engaging the thread of said screw and adapted to cause the rotation thereof, comprising opposed pairs of sliding blocks engaging opposite sides of the thread of the screw, and means mounting the blocks for oscillating movement about axes inclined at opposite acute angles to an axis perpendicular to the axis of the screw.

4,624,289

BELT TRANSPORTER FOR ELECTRONIC COMPONENTS

Franciscus J. A. Storimans, Stouffville, Canada, assignor to Frank Storimans Limited, Gormley, Canada

Continuation of Ser. No. 734,828, May 17, 1985, abandoned, which is a continuation of Ser. No. 555,824, Nov. 28, 1983, abandoned. This application Oct. 24, 1985, Ser. No. 790,654
Int. Cl.[4] B21F *45/00*
U.S. Cl. 140—105 5 Claims

1. A machine for forming the leads of electronic components, the electronic components being intially arranged with their leads secured to and projecting laterally from an elongated tape at uniformly spaced intervals along the length thereof, said machine comprising;

(a) a frame having an upright front wall, said upright front wall having a support face at one side thereof extending in a first plane,

(b) an endless load transporting belt adapted to drivingly engage a lead supporting tape,

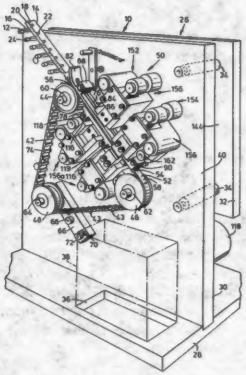
(c) belt mounting means on said upright front wall and projecting from said first plane for supporting said load transporting belt for movement thereon, said load transporting belt having a forward run extending along a longitudinally elongated planar work path which extends through a work station in which leads of electronic components are formed to the required configuration, said belt mounting means having a free end remote from said upright front wall and over which said endless transporting belt may pass to be mounted on or removed from an operable position with pespect to said belt mounting means without the need to dismantle said frame,

(d) a first guide rail mounted on said support face of said upright wall and disposed opposite and extending longitudinally of said forward run to define a component guideway therebetween which extends through said work station,

(e) a second guide rail mounted on said support face of said upright wall and underlying and supporting said forward run of said load transporting belt, and

(f) drive means engaging said load transporting belt to drive it through said work station,

(g) at least one lead working mechanism located in said work station for use in forming the leads of said electronic components, each lead working mechanism being mounted on said support face of said upright front wall and projecting outwardly therefrom to an exposed free end, each lead working mechanism having work tool members releasably mounted at the free end thereof, said work tool members being disposed laterally outwardly from the forward run of said load transporting belt and remote from said upright front wall so as to be moveable in a work plane which is disposed laterally outwardly from the forward run of said load transporting belt so as to be operable to engage the leads of electronic components which project laterally from the load transporting belt in use.



4,624,290

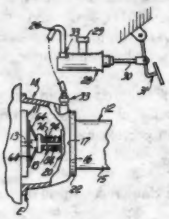
PREFILLED HYDRAULIC CONTROL APPARATUS FOR MOTOR VEHICLE

David J. Compton, Troy; Richard A. Nix, Utica, and Keith V. Leigh-Monstevens, Troy, all of Mich., assignors to Automotive Products plc, Warwickshire, England

Filed Nov. 28, 1983, Ser. No. 555,667
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—1 5 Claims

1. A method of prefilling a hydraulic control apparatus prior to shipment of said hydraulic control apparatus to a user, said hydraulic control apparatus comprising a hydraulic master cylinder, a remote hydraulic slave cylinder, and a conduit connecting said master cylinder to said slave cylinder, said method comprising disposing a leakproof connector having two interengageable complementary members on said conduit between said master cylinder and said slave cylinder, momentarily interconnecting said connector complementary members, filling said hydraulic control apparatus with hydraulic fluid, disconnecting said connector complementary members

prior to shipment of said apparatus to the user, and providing said connector complementary members with one-way inter-



locking means preventing disconnect of said members after said connector members have been reengaged by the user.

4,624,291

METHOD OF PREFILLING MODULAR HYDRAULIC CONTROL APPARATUS

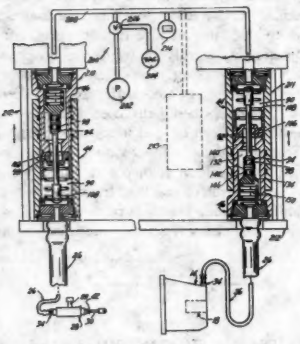
David J. Compton, Troy; Richard A. Nix, Utica, and Keith V. Leigh-Monstevens, Troy, all of Mich., assignors to Automotive Products plc, Warwickshire, England

Continuation-in-part of Ser. No. 607,020, Apr. 30, 1984, which is a continuation-in-part of Ser. No. 555,667, Nov. 28, 1983. This application Dec. 10, 1984, Ser. No. 680,329

The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—1 **3 Claims**



1. A method of prefilling a hydraulic apparatus prior to shipment of said hydraulic apparatus to a user, said hydraulic apparatus comprising a master cylinder, a remote slave cylinder and a conduit connecting said master cylinder to said slave cylinder, said master cylinder, said slave cylinder and said conduit being supplied in the form of at least two separate modular units each capable of being coupled to the other by a leakproof connector having two interengageable complementary members having each a port providing fluid communication between said members when coupled together and means closing said ports when uncoupled, said method comprising simultaneously filling with hydraulic fluid each separate modular unit of said hydraulic apparatus provided with one of said complementary members, and providing said connector complementary members with one-way interlocking means preventing disconnect of said members after said members have been coupled by the user.

4,624,292

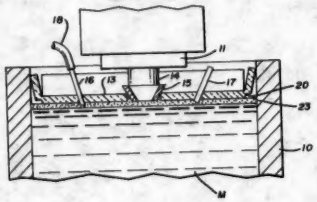
METHOD AND APPARATUS FOR POURING MOLTEN METAL IN A NEUTRAL ATMOSPHERE

Micheal D. Labate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Mar. 18, 1985, Ser. No. 713,335

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—5 **14 Claims**



14. The method of pouring molten steel into an ingot mold in an oxygen free atmosphere comprising the steps of sequentially; placing a flat closure on said ingot mold in air sealing relation thereto; said closure having an opening therein; placing a known quantity of hexamethylene in said ingot mold; engaging the nozzle of a ladle in sealing relation in said opening; pouring molten steel through the nozzle through said opening and into said ingot mold so as to vaporize said hexamethylene to fill said ingot mold and expel atmospheric air therefrom; pouring molten steel through said nozzle and opening to fill said ingot mold with said molten steel to a level adjacent said closure; moving said closure into said ingot mold to a position adjacent said molten steel.

4,624,293

TREE PRUNING MACHINE

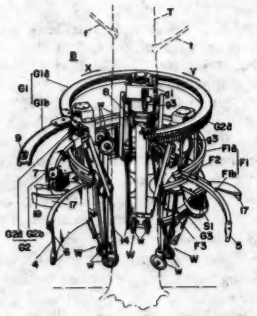
Yasunaga Suezaki, Yame, Japan, assignor to Kaisei Kogyo Corporation, Kumamoto, Japan

Filed May 10, 1985, Ser. No. 733,271

Claims priority, application Japan, May 31, 1984, 59-113730

Int. Cl.[4] A01G *23/02*; B27L *1/00*

U.S. Cl. 144—2 Z **2 Claims**



1. A tree pruning machine comprising:

a generally annular body;

means for detachably mounting the body to a standing tree;

a cutting unit detachably mounted on the body;

means for rotating the cutting unit around a periphery of the body;

means for elevating the body vertically on the tree, the elevating means including at least 3 radially moveable wheel units coupled to the body and having a plurality of upper and lower wheels capable of rotation along a surface of the tree;

means for simultaneously moving the wheel units by the same radial distance; and

means for biasing the wheel units equally against the surface of the tree.

4,624,294

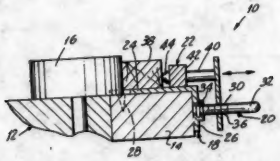
WOOD THICKNESS ATTACHMENT

Charles A. Robinson; Steven B. Perry, both of 31 Ensign Ave., Barnegat, N.J. 08005, and George Spector, 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Jul. 29, 1985, Ser. No. 759,754

Int. Cl.⁴ B27B *31/00*; B27C *1/12*

U.S. Cl. 144—253 F **4 Claims**



1. A wood thickness attachment for a jointer planar, said planar having an angle/wood guide and a rotary cutter wherein said attachment comprises:

(a) an L-shaped attachment bracket having a first horizontal leg mounted on the upper horizontal surface of said guide and a second vertical leg adjacent the vertical surface of said guide;

(b) an adjustment rod having a threaded shaft with a crank handle rotatably affixed transversely to said second leg of said bracket;

(c) a thickness adjustment plate threadably mounted on said shaft;

(d) a roller guide affixed transversely to said plate above said adjustment rod so that when a piece of wood is placed onto said jointer planer abutting said roller guide actuation of said crank handle will cause said roller guide to urge said piece of wood against said cutter.

4,624,295

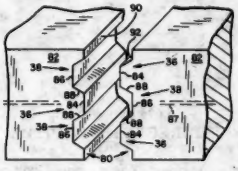
METHOD OF MANUFACTURING A FINGER-JOINTED WOOD PANEL

William A. Howland, Portland, Oreg., assignor to The Nicolai Company, Portland, Oreg.

Filed May 20, 1985, Ser. No. 735,685

Int. Cl.⁴ B27F *1/00*

U.S. Cl. 144—347 **8 Claims**



1. A method of manufacturing multiple wood panels of equal thickness from a slab of greater thickness made up of multiple lengths of lumber edge-glued together along finger joints, said method comprising:

cutting lengthwise alternating fingers and grooves into the side edges of the lengths of lumber to be joined and in so cutting:

forming the fingers of one edge of one length substantially complemental in shape to the grooves of the adjacent edge of an adjacent length, the fingers and grooves each having flats greater in width than the thickness of kerf produced by a resawing operation;

dimensioning and positioning such flats across the thickness dimension of the lumber such that the kerf will pass through a flat between its opposite side edges when the slab is resawn into the panels of equal thickness; and

forming the fingers and grooves in sufficient number such that the resulting panels will be made up of lumber lengths joined together at edge joints comprising at least one complete complemental finger and groove;

then inserting and edge-gluing the fingers of one set of edges of the lengths into the complemental aligned grooves of an adjacent set of edges of the lengths to form said slab; and

then resawing said slab into said multiple panels of equal thickness, whereby the resulting panels comprise multiple lengths of lumber edge-glued together at complete finger joints, with such joints having joint lines on the panel faces extending lengthwise of the panels substantially parallel to the panel side edges.

4,624,296

PNEUMATIC TIRE SUITABLE FOR RUNNING ON SNOW AND ICE ROADS

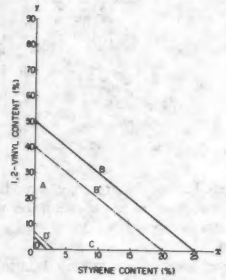
Eiji Takiguchi, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,455

Claims priority, application Japan, Dec. 12, 1983, 58-232728; May 23, 1984, 59-102726

Int. Cl.⁴ B60C *1/00*, *11/00*

U.S. Cl. 152—209 R **4 Claims**



1. A rubber composition for a tire comprising 100 parts by weight of a blend rubber consisting of (A) 25 to 85 parts by weight of natural rubber or polyisoprene rubber and 5 to 25 parts by weight of butyl rubber or halogenated butyl rubber and (B) 10 to 50 parts by weight of butadiene-styrene copolymer rubber containing 1 to 10% of bonded styrene group (x) and 2 to 20% of 1,2 vinyl bond group (y), (x) and (y) satisfying the following relationship:

$$\left(\frac{y-50}{x}\right) \leqq -2 \text{ and } \left(\frac{y-5}{x}\right) \geqq -\frac{5}{2}$$

4,624,297

BULLET CASTING MACHINE

Robert L. Clausen, P.O. Box 881, Chandler, Ariz. 85224

Filed Sep. 25, 1985, Ser. No. 780,004

Int. Cl.⁴ B22D *33/04*; B21K *21/06*

U.S. Cl. 164—262 **5 Claims**

1. A hand operated semi-automatic bullet casting machine comprising:

a frame,

an electrically energized metal melting pot mounted on said frame for dispensing molten metal through an orifice in its bottom,

a horizontal actuator shaft rotatably mounted within said frame below said melting pot,

a support arm rigidly secured at one end to said actuator shaft and extending substantially perpendicularly therefrom,

mold means mounted on said support arm below said melting pot and having at least one cavity for aligning with said orifice,

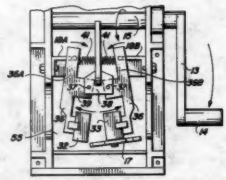
said mold means comprising two relatively movable portions normally biased into engagement with each other and forming between their juxtapositioned engaging portions and cavity,

metering means mounted on said melting pot for controlling the flow of molten metal from said melting pot through said orifice and into said cavity of said mold means,

said metering means comprising a valve means for opening and closing said orifice,

a pivotally movable flat plate having at least one aperture extending therethrough mounted on a face of said mold means for movement thereover from a first portion to a second portion laterally of the longitudinal axis of said melting pot and said mold means for aligning in the first position said aperture with said orifice and said cavity,

pin means mounted on said frame for engaging said flat plate upon movement of said mold means to rotate said flat plate from said first position to said second position,



said aperture having a sharp edge immediately adjacent said cavity for cutting off any sprue of the bullet extending out of said cavity upon rotation of said plate to the second position,

spring biased lever means mounted on said melting pot and connected to said valve means for normally closing said valve means under the bias of its spring,

crank means secured to one end of said actuator shaft for manually rotating said shaft, support arm and said mold means and causing movement of said flat plate, said rotation comprising upward and downward strokes of said crank means,

cam means mounted at the bottom of said frame and positioned to engage said mold means near the end of its downward stroke,

said crank means when moved upwardly rotating said two rotatively movable portions of said mold means into engagement, said cavity in alignment with said orifice of said melting pot, and said flat plate to a first position for a pouring operation,

said lever means when actuated opening said valve means causing molten metal to flow from said melting pot through said orifice and into said cavity until filled,

sequential downward movement of said crank means causing rotative movement of said flat plate to cause said sharp edges of said apertures to trim away any sprue extending out of said cavity and engagement of said mold means with said cam means to cause separation of the movable portions of said mold means causing the molded bullet formed in said cavity to fall free from said mold means.

4,624,298

METHOD OF COOLING STRANDS IN THE CONTINUOUS CASTING OF STEEL

Günter W. Rudolph, Jork; Karl Stercken, Rosengarten, and Eckehard F. O. Forster, Seevetal, all of Fed. Rep. of Germany, assignors to Hamburger Stahlwerke GmbH, Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP81/00191, § 371 Date Aug. 17, 1982, § 102(e) Date Aug. 17, 1982, PCT Pub. No. WO82/02160, PCT Pub. Date Jul. 8, 1982

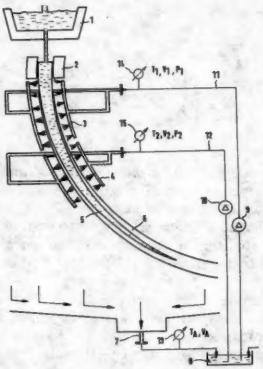
Continuation of Ser. No. 413,366, Aug. 17, 1982, abandoned.

This PCT application Dec. 11, 1981, Ser. No. 746,950

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048711

Int. Cl.⁴ B22D *11/124*

U.S. Cl. 164—486 **10 Claims**



1. A method of continuous casting of a strand of steel with a carbon content of 0.4 to 1 percent by weight, comprising the steps of spraying on the strand emerging from a strand casting mold a cooling liquid in a secondary cooling zone in a first step intensively and in a second step at a reduced cooling rate, the temperatures, rates of flow and pressures of the cooling liquid being adjusted so as to remove an amount of heat of 50 Wh/kg to 90 Wh/kg from a first stage in the secondary cooling zone, the cooling being performed at a cooling rate of 65 Wh/(kg.min) to 100 WH/(kg.min), and so as to remove in an adjoining second stage an amount of heat of 20 Wh/kg to 80 Wh/kg at a cooling rate of 30 Wh/(kg.min) to 60 Wh/(kg.min).

4,624,299

METHOD OF INDIRECT LIQUID-PHASE HEAT TRANSFER

Ronald H. Harding, Westport, Conn., and George E. Totten, West Haverstraw, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

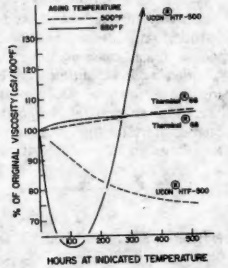
Filed Jun. 28, 1985, Ser. No. 749,783

Int. Cl.⁴ F28F *23/00*; C09K *5/00*

U.S. Cl. 165—1 **21 Claims**

15. A method of liquid-phase indirect heat transfer which comprises continuously circulating in an indirect heat exchange system a heat transfer fluid comprising a substantially anhydrous water-soluble ethoxylated monohydric C_{12} to C_{14} aliphatic alcohol having a viscosity of from about 20 to about 60 centistokes at 100° F. and an effective amount of a stabilizer

to provide a viscosity loss or (b) a viscosity gain of less than about 20%, after 500 hours of continuous use as per the Thermal Stability Test wherein the system temperature is maintained at about 550° F.

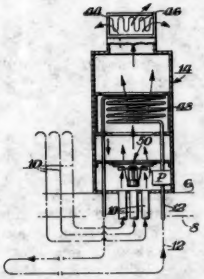


4,624,300

METHOD AND APPARATUS FOR HEATING AND COOLING BUILDINGS

Louis Stubbolo, Wyoming, Del., assignor to Aire-Wrap, Inc., Dover, Del.

Filed Apr. 24, 1985, Ser. No. 726,628
Int. Cl.⁴ F24J *3/02*
U.S. Cl. 165—45 **8 Claims**



5. A combination building structure and heating and cooling means therefor comprising:

(a) a water circulating system wherein water is circulated below ground and below the frost line at the site of said building to collect low grade heat in the range of about 45° F. to about 65° F.,

(b) means for directing said water to and through a heat exchange coil, the water circulating in a continuous manner through said circulating system and said coil,

(c) an air circulating system including piping having inlet and discharge ends, said inlet end positioned above ground outside said building, said piping connected to second heat exchange means which are located below the frost line at said building site, and having means for drawing ambient air into said air circulating system through said inlet end, directing said air through said second heat exchange means to collect low grade heat and discharging said air through said discharge end over said heat exchange coil to further condition the air, said heat exchange coil and said air acting as a shell and tube type heat exchanger, said air passing said coil being directed to and through

(d) duct means which direct said conditioned air into the inside of said building wherein said air is allowed to circulate and flow to and through

(e) vents extending substantially continuously around the periphery of said building generally adjacent the floor of said building which connect the inside of said building to

(f) vertical wall channels in the walls of said building substantially around the periphery of said building, said air passing upwardly through the wall channels to

(g) roof channels in the roof structure of said building into and through which said air passes, and

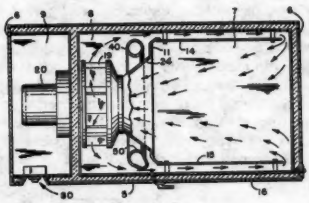
(h) exhaust means connected to said roof channels through which said air exhausts to the atmosphere, the wall and roof channels providing an insulating sheath of air within the walls and the roof of the building.

4,624,301

GAS CONVECTION OVEN WITH EGG-SHAPED HEAT EXCHANGER TUBE

George T. Baggott, Cleveland, and Myron T. Cooperrider, North Royalton, both of Ohio, assignors to Crescent Metal Products, Inc., Cleveland, Ohio

Division of Ser. No. 418,056, Sep. 14, 1982, Pat. No. 4,484,561.
This application Aug. 1, 1984, Ser. No. 636,484
Int. Cl.⁴ F24H *3/08*; F28F *1/02*
U.S. Cl. 165—47 **2 Claims**



1. A heating system, comprising a heating compartment, a tubular heat exchanger within said heating compartment, heat input means for supplying hot fluid into said heat exchanger for flowing therein, and means for causing other fluid to flow across said heat exchanger in a direction generally transverse to the longitudinal axis of said heat exchanger for transfer of thermal energy from said heat exchanger to such other fluid flowing thereacross, said heat exchanger having an egg-shaped cross-section oriented with its narrow end facing downstream of the flow of such other fluid, said heating compartment having wall means cooperatively positioned with respect to said heat exchanger further to direct flow of such other fluid on both sides of said heat exchanger, said wall means including a wall adjacent to and generally parallel to the longitudinal axis of said heat exchanger, and the major axis of the egg-shape cross-section being oriented at an angle to the direction of flow of such other fluid and at an angle to said wall with its narrower end nearest said wall to define with such wall a restricted flow passage for such other fluid at said narrower end, whereby such other fluid flowing across said heat exchanger will be caused to flow closely over substantially the entire exterior extent thereof to maximize thermal energy transfer while minimizing heat concentration at the downstream side of the heat exchanger.

4,624,302

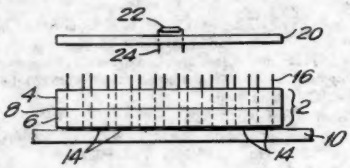
APPARATUS FOR PREHEATING PRINTED CIRCUIT BOARDS

John R. Hayden, and Curtis L. Huetson, both of Denver, Colo., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jul. 2, 1984, Ser. No. 626,793
Int. Cl.⁴ H01L *23/40*; F28F *13/00*
U.S. Cl. 165—80.2 **1 Claim**

1. In combination, heating means having a flat horizontal upwardly facing heating surface, a heat transfer device com-

prising a thermally nonconductive horizontal rigid base plate and a large plurality of elongated thermally-conductive vertical heating elements extending through and upwardly beyond said plate from bottoms of said elements on the underside of said plate to upper tips of said elements all lying in a common horizontal plane above said plate, said elements being fixedly supported in fixed alignment with each other by said plate and being distributed over the horizontal area of said plate so that their tips are arranged in said plane in a two-dimensional pattern of tips uniformly spaced in such pattern from each other, and said device being supported by said heating surface so that



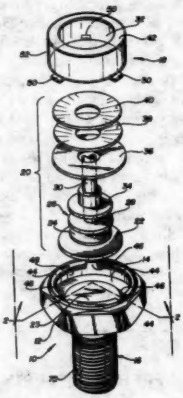
the bottoms of said elements abut and are in thermal contact with said surface, and a printed wiring board having electric circuit components on the top thereof and having leads of said components extending through said board to project downwardly beyond the bottom thereof, said board resting on said pattern of heating element tips with the downwardly projecting leads from said board being interspersed with ones of said elements to extend downward in the spaces therebetween so that said pattern of tips supports said board to be level to permit substantially uniform heating of all portions of said board by said elements.

4,624,303

HEAT SINK MOUNTING AND METHOD OF MAKING

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Filed Apr. 29, 1985, Ser. No. 728,303
Int. Cl.[4] F28F 7/00
U.S. Cl. 165—80.2 **19 Claims**



1. A heat sink mounting for a semi-conductor device, comprising:

a base member, including a base body defining a generally cylindrical recess in its upper surface and a downwardly extending stem portion, said base body further including a plurality of inwardly extending flanges spaced around the opening of said cylindrical recess and defining open areas therebetween, and

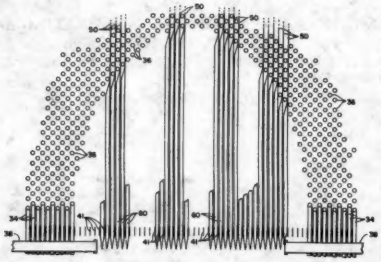
a cap member having a substantially cylindrical side wall and a plurality of tabs extending radially outward from the bottom of said cylindrical side wall, said tabs being sized and spaced around said side wall in correspondence to the size and spacing of said open areas between said flanges, whereby said heat sink mounting may be assembled by first inserting the bottom of said cap member into said cylindrical recess with said tabs aligned with said open areas so as to pass therethrough, and then rotating said cap member such that said tabs are positioned beneath said flanges.

4,624,304

EXPANDABLE SUPPORT FOR INSERTION INTO TUBE BUNDLE

James K. Hayes, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 25, 1985, Ser. No. 801,444
Int. Cl.[4] F28F 9/00
U.S. Cl. 165—162 **1 Claim**



1. In a shell and tube heat exchanger, including an upright vessel housing a plurality of rows of internested U-tubes, which U-tubes have both ends secured to the tube sheet near the bottom of the vessel, with the U-bends being located near the top thereof, said internested U-tubes extending from a point adjacent the vessel wall, to a point adjacent the central axis thereof, there being a cylindrical open space along the longitudinal axis of the vessel inside of the U-tubes, a plurality of support bars supporting the U-bends of the tubes, there being a bar between each row of U-tubes, which extends from a position outside of the U-tubes to a position in the cylindrical open space, the method of supporting and spacing the support bars and the U-bends, including the steps of positioning a flattened metal tubular member between each row of internested U-tubes, extending from a position outside of the U-tubes to a position in the cylindrical open space, wherein each flattened tube has been spot welded at various points in the portion of the flattened tube that will lie between the internested U-tubes to prevent expansion of that portion of the tube, applying a pressure to each of the flattened tubes to cause that portion of each flattened tube to expand which lies in the cylindrical open space, thus supporting each end of each of the bars, holding such bars firmly in place.

4,624,305

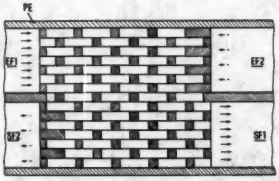
HEAT EXCHANGER WITH STAGGERED PERFORATED PLATES

Alexandre Rójey, Garches, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 25, 1982, Ser. No. 352,425
Claims priority, application France, Feb. 25, 1981, 8103902
Int. Cl.[4] F28F 7/00
U.S. Cl. 165—165 **11 Claims**

1. A device for exchanging heat between at least two fluids

at different temperatures, the device comprising a heat exchange zone and, for each of said fluids, supply and discharge means interfacing with said heat exchange zone, said device being characterized in that said heat exchange zone consists of a stack of rectangular plates having perforations of elongate shape arranged in rows extending parallel to one another and parallel to one pair of opposite edges of said rectangular plates, said stack having opposed surfaces with first continuous face surfaces and second continuous face surfaces and means for demarking between the first and second continuous face surfaces, said elongate perforations being of substantially the same size, being of identical shape and being regularly spaced along the rows of each of said plates with a distance between the adjacent ends of two adjacent perforations of the same row being less than the length of said perforations, the perforations being arranged on the respective plates with said plates stacked with each row of perforations superimposed upon a row of an adjacent plate, such that each perforation in a row of an intermediate plate disposed between two adjacent plates communicates with two perforations of the corresponding row of each of the adjacent plates, thus forming at least first and second separate networks of interconnecting rows of perforations said rows in said separate networks having no communication with



one another within said heat exchanger; each of the first and second separate networks being used to circulate one of the fluids participating in the exchange, with the network of perforations for circulating one of the fluids being adjacent to the paths of the network circulating the other fluid; the first of said networks used to circulate the first fluid having a plurality of perforations opening only at the first continuous faces of the stack; the second of said networks used to circulate the second fluid having a plurality of perforations opening only at the second continuous faces of the stack; means for blocking opening of the perforations of the second network at the first continuous faces and means for blocking opening of the perforations of the first network at the second continuous faces, the supply and discharge means interfacing with the heat exchange zone including first inlet and outlet duct means each having a continuous opening, the duct means being only in open communication with a plurality of rows of perforations in the first continuous faces for transporting the first fluid to and from the first continuous faces; the supply and discharge means further including second inlet and outlet duct means each having a continuous opening, the second duct means being only in open communication with a plurality of rows of perforations in the second continuous faces for transporting the second fluid to and from the second continuous faces.

4,624,306

DOWNHOLE MOBILITY AND PROPULSION APPARATUS

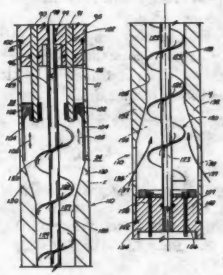
Jack J. Traver; C. Dale Palmer, both of Lafayette, and Richard Hughes, Youngsville, all of La., assignors to Traver Tool Company, Lafayette, La.

Continuation of Ser. No. 505,583, Jun. 20, 1983. This application Apr. 3, 1985, Ser. No. 719,892

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] E21B *44/00*

U.S. Cl. 166—53 **4 Claims**



2. An apparatus for steering equipment downhole comprising:

a. a tool body;

b. steering means contained within said tool body including gate means, movable between upward and downward positions;

c. impeller means rotatably mounted within said tool body; and

d. means for imparting rotation to said impeller means as said fluid moves within said steering means for steering said tool.

4,624,307

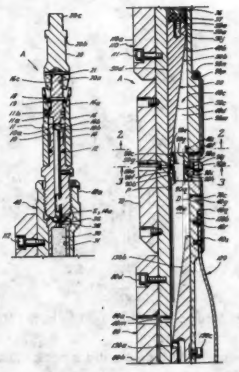
EXPLOSIVE PERFORATING TOOL

Karl S. Kinley, Houston, Tex., assignor to J. C. Kinley Company, Houston, Tex.

Filed Sep. 26, 1985, Ser. No. 780,621

Int. Cl.[4] E21B *43/112*

U.S. Cl. 166—55.3 **27 Claims**



1. An explosive tool for perforating tubing comprising:

an elongated barrel having a longitudinal cavity therein, said cavity adapted to be filled with a fluid, said barrel having a lateral passage in communication with said longitudinal cavity and the outer surface of said barrel, said lateral passage dividing said cavity into a drive zone and a stop zone;

a piston initially disposed within said longitudinal cavity in alignment with said lateral passage and substantially closing said lateral passage, and laterally movable from said initial position to a fired position wherein said piston extends through said lateral passage of said barrel;

said piston having a longitudinal bore therethrough, such that when said piston is in said initial position said longitudinal bore provides a restricted flow passage for said fluid through said piston; and

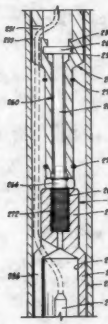
means for explosively increasing the pressure in said longitudinal cavity to provide a fluid pressure build-up in said longitudinal cavity which forces said piston laterally from said initial position to said fired position.

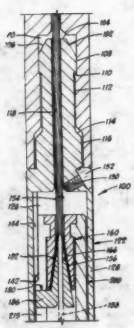
4,624,308

SOUR GAS CABLE HEAD

Billy W. White, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 15, 1985, Ser. No. 723,773
Int. Cl.[4] E21B *47/00*
U.S. Cl. 166—65.1 **14 Claims**





1. A cable head for suspending a downhole tool from a cable in a well bore, comprising:

tubular body means having a fishing neck at the top thereof;

a longitudinally oriented cable bore extending from the top of said fishing neck to the interior of said body means;

cable wedge means within said body means adapted to receive and grip strands from the exterior of said cable;

tensile bar means adapted to part under application of a predetermined tensile stress thereto, said tensile bar means being secured in said body means against bending stress and isolated from torsional stress; and

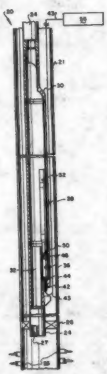
tubular link slip means disposed about said cable wedge means, said tensile bar means having a head anchored in said link slip means against longitudinal movement in rotatable relationship thereto, and a longitudinal extending body supported against bending stress thereby.

4,624,309

APPARATUS FOR MONITORING A PARAMETER IN A WELL

Mark A. Schnatzmeyer, Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 24, 1984, Ser. No. 653,585
Int. Cl.[4] E21B *47/00, 23/03*
U.S. Cl. 166—66 **10 Claims**



1. A side pocket mandrel for receiving an electrically powered instrument for monitoring a parameter, such as pressure, temperature, or the like, at a subsurface location in a well, comprising:

a. an elongate body having connection means at its upper and lower ends for attachment in a string of well tubing and having a flow passage therethrough alignable with the bore of the tubing;

b. a receptacle bore in said body laterally offset from and extending alongside said flow passage, the lower end of said receptacle bore opening to the exterior of said body;

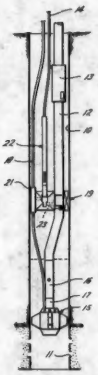
c. an internal longitudinal keyway-like channel in the wall of said flow passage aligned with and extending upwardly from the upper end of said receptacle bore to a location near the connection means at the upper end of said body, the inward side of said channel being open to said flow passage, the upper end of said receptacle bore being accessible through said channel by tools lowered through said well tubing into the flow passage of said body; and

d. an electrical contact assembly sealingly engaged in and closing the lower end of said receptable bore and having an insulated conductor rod extending therethrough, the lower end of said insulated conductor rod being connectable to electrical conduction means extending to the surface, and the upper end of said conductor rod extending into said receptacle bore providing an electrical contact engageable by an electrical contact of an instrument lowered through the well tubing and installed in said body with its lower end received in said receptacle bore and its major portion housed in said channel above said receptacle bore, leaving said flow passage unobstructed.

4,624,310
WELL APPARATUS

Ralph H. Echols, Carrollton; Bhanubhai H. Patel, Grand Prairie, both of Tex., and James B. Renfroe, Jr., Valencia, Calif., assignors to Otis Engineering Corporation, Carrollton, Tex.

Filed May 20, 1985, Ser. No. 736,232
Int. Cl.[4] E21B *43/12, 34/10*
U.S. Cl. 166—106 11 Claims



1. Apparatus comprising:

a well packer having at least two flow ways therethrough,

a conduit providing a first control pressure,

vent valve means connected to said conduit and controlling one of said flow ways and having a flow member reciprocal in both directions between open and closed positions for multiple cycles in response to a first control pressure in said conduit, said vent valve means remaining closed in the absence of first control pressure and when subjected to a second ambient pressure less than a selected value, and

kill valve means associated with said packer and vent valve and in combination with one of said flow ways, said kill valve means opening in response to a second ambient pressure above said selected value.

4,624,311
LOCKING MECHANISM FOR HYDRAULIC RUNNING TOOL FOR WELL HANGERS AND THE LIKE

Bobby F. Goad, San Antonio, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Sep. 26, 1985, Ser. No. 780,447
Int. Cl.[4] E21B *23/02*
U.S. Cl. 166—125 5 Claims

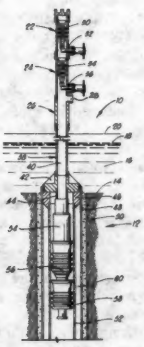
1. A running tool for installing a hanger in a subterranean well conduit, said hanger having a hollow housing and spring-pressed, radially shiftable slip elements mounted on the exterior of said hollow housing, comprising: a tubular body portion attachable to a tubing string; means for detachably connecting said tubular body portion to said hollow housing; an actuating sleeve axially slidably mounted on said body portion and operatively engagable in one axial position with said hanger slip elements to secure same in a radially retracted position for run-in; radially shiftable locking means disposed between said actuating sleeve and said tubular body portion to secure said actuating sleeve in said one axial position when said locking means is in its radially outer position; an annular piston axially slidably mounted on said tubular body portion in an annular fluid pressure chamber defined between said actuating sleeve and said tubular body portion; said piston having a portion holding said locking means in said radially outer position when said piston is in said one axial position; shearable means securing said piston in said one axial position of said piston for run-in purposes; and means for supplying fluid pressure to said annular fluid pressure chamber to axially move said piston to shear said shearable means, release said locking means and to axially

shift said actuating sleeve by said piston from said one axial position of said actuating sleeve to release said slip elements for movement into engagement with the conduit bore.

4,624,312
REMOTE CEMENTING PLUG LAUNCHING SYSTEM

Kurt M. McMullin, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 5, 1984, Ser. No. 617,426
Int. Cl.[4] E21B *33/16*
U.S. Cl. 166—155 13 Claims



1. An improved remote cementing plug launching system, comprising:

a first cementing plug releasably secured to a plug release assembly;

a second cementing plug releasably secured to said first cementing plug; and

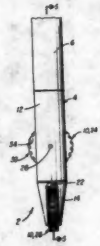
collapsible guide tube means extending from said first cementing plug to a dart seat means in said second cement plug.

4,624,313

WELL TOOL DISLODGEMENT APPARATUS

Chester L. Coshow, P.O. Box 843, Chickasha, Okla. 73018

Filed Jun. 24, 1985, Ser. No. 748,039
Int. Cl.[4] E21B *17/10*
U.S. Cl. 166—241 11 Claims



1. An apparatus for assisting the lowering of an object into a well having a wall, said apparatus comprising:

adapter shoe means for coupling said apparatus with the object, said adapter shoe means having a first end and a second end spaced from said first end;

first roller means for engaging the wall of the well, said first roller means having a first plurality of protuberances defined along the periphery thereof so that said protuberances engage the wall of the well to rotate said first roller means thereby tending to prevent the object from becoming stuck against the wall when said adapter shoe means couples said apparatus with the object and the object is lowered into the well, wherein said first roller means has a first side surface and a second side surface spaced from said first side surface, and each of said first plurality of protuberances is disposed between said first and second side surfaces at an oblique angle thereto; and

first roller attachment means for attaching said first roller means near said second end of said adapter shoe means.

4,624,314

MODIFIED WATERFLOOD TECHNIQUE FOR ENHANCED HYDROCARBON RECOVERY FROM ARGILLACEOUS SUBTERRANEAN RESERVOIRS

Greig J. Clark, Calgary, Canada, assignor to Amerigo Technology Limited, Alberta, Canada

Filed Jun. 3, 1985, Ser. No. 740,243
Claims priority, application Canada, Apr. 29, 1985, 480293
Int. Cl.[4] E21B *43/27*
U.S. Cl. 166—271 19 Claims

1. A method of recovering hydrocarbons from an argillaceous subterranean rock formation by a modified waterflood technique involving injecting an aqueous solution into an input well drilled into the formation and recovering oil displaced by said solution from at least one production well drilled into said formation, wherein the method comprises:

increasing the permeability of the formation adjacent to the input well by injecting a strongly acidic aqueous solution into the formation;

displacing said strongly acidic solution into the formation by injecting an aqueous acidic surfactant treatment solution containing a clay stabilizing agent into the formation through said input well, said treatment solution initially injected having a total ionic concentration approaching that of said acidic aqueous solution but the concentration of said treatment solution being gradually reduced as more of said treatment solution is injected until a threshold concentration is reached, said threshold concentration being substantially the lowest concentration of the acid, surfactant and clay stabilizing agent capable of maintaining acceptable permeability of the formation and a mobility ratio between the treatment solution and hydrocarbons displaced from the formation of about 1.0 or less; and

continuing the injection of said treatment solution having said threshold concentration in order to displace hydrocarbons from the formation.

4,624,315

SUBSURFACE SAFETY VALVE WITH LOCK-OPEN SYSTEM

Rennie L. Dickson, Carrollton, and Roddie R. Smith, The Colony, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 5, 1984, Ser. No. 658,275
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—323 19 Claims

1. A well safety valve comprising:

a housing having a bore therethrough;

a valve mounted in said housing to open and close to control the flow through said bore;

an operator tube in said housing for opening said valve;

means in said housing for moving said operator tube in a first direction to open and hold said valve open;

means in said housing for moving said operator tube in a second direction to permit said valve to close;

a temporary lockout sleeve in said housing in tandem with said operator tube for temporarily holding said valve open, said operator tube and said lockout sleeve being in end-to-end contact when said lockout sleeve is inoperative and said operator tube is holding said valve open, when said operator tube and said lockout sleeve are moving simultaneously in said housing between operating positions, and when said operator tube is inoperative and said lockout sleeve is holding said valve open; and

said operator tube and said lockout sleeve each having means for coupling said operator tube and said lockout sleeve with a lockout tool for moving said operator tube and said lockout sleeve simultaneously when said lockout sleeve is moved from said inoperative to an operative position holding said valve open.

4,624,316

SUPER SEAL VALVE WITH MECHANICALLY RETAINED SEAL

Morris G. Baldridge, and Bob L. Sullaway, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 28, 1984, Ser. No. 655,979
Int. Cl.[4] E21B *34/08;* E16K *15/00*
U.S. Cl. 166—325 5 Claims

1. An improved valve assembly used in a well cementing

tool in a well cementing operation or the like, said valve assembly comprising:

an annular valve body housing retained within said cementing tool or the like, the annular valve body housing comprising:

a valve seat portion having a bore therethrough; and

a valve spring retainer portion secured to the valve seat portion and having a bore therethrough, the valve spring retainer portion comprising:

an annular outer cylindrical member having a valve body guide retained therein by means of a plurality of supports extending from the outer cylindrical member to the valve body guide; and

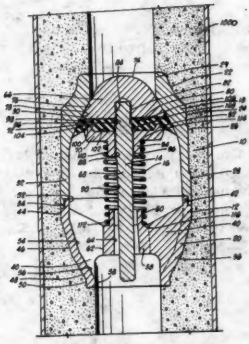
a valve body retained within the valve body housing, the valve body including;

a valve body head adapted to engage a portion of the interior of the valve body housing, the valve body head comprising:

a cylindrical member having a spherical end, frusto-conical outer surface and end surface having, in turn, a blind threaded bore therein;

a valve body stem having one end secured to the valve body head, the valve body stem comprising:

an elongated cylindrical member having a first threaded surface which releasably threadedly engages the blind threaded bore in the end surface of the valve



body head, a first cylindrical surface, a second threaded surface which is slidably received and retained within the valve spring retainer portion of the annular valve body housing;

an elastomeric valve seal retained on the valve body stem in constant, uninterrupted, abutting relationship with the valve body head and adapted to sealingly engage a portion of the interior of the valve body housing, the elastomeric valve seal comprising:

a circular elastomeric member having an upper end surface, a frusto-conical sealing surface, a bottom end surface having, in turn, an annular recess therein, a first bore which receives the first cylindrical surface of the valve body stem therein, and a second bore which receives a portion of the second threaded surface of the valve body stem therein;

a valve seal retainer secured to the valve body stem having a portion thereof abutting the elastomeric valve seal constantly to prevent movement of the elastomeric valve seal on the valve body stem and with respect to the valve body head, the valve seal retainer comprising:

a cylindrical member having an annular rib on one end thereof engaging the annular recess in the bottom end surface of the circular elastomeric member, a spring retainer portion on the other end thereof, and a threaded bore therethrough which threadedly engages the second threaded surface of the valve body stem; and

a valve spring adapted to resiliently bias the valve body head and elastomeric valve seal into engagement with a portion of the interior of the valve body housing.

4,624,317

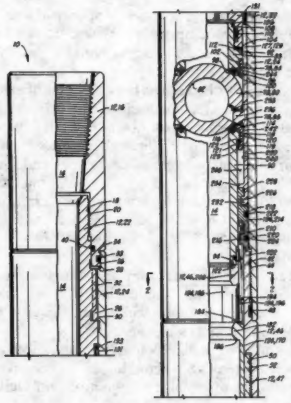
WELL TOOL WITH IMPROVED VALVE SUPPORT STRUCTURE

Burchus Q. Barrington, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 12, 1984, Ser. No. 649,867

Int. Cl.[4] E21B *34/12*

U.S. Cl. 166—334 **9 Claims**



1. A pressure responsive well testing apparatus which is actuated in response to changes of fluid pressure in the wellbore in which said apparatus is disposed, comprising:

housing means adapted to be connected in a well test string, said housing means having a housing bore therethrough;

a pressure responsive valve assembly disposed in said housing means, said pressure responsive valve assembly including a spherical valve member having a valve bore therethrough, and including upper and lower annular seats engaging said spherical valve member, said spherical valve member being rotatable within said seats between a closed position wherein said spherical valve member closes said housing bore, and an open position wherein said valve bore and said housing bore are aligned;

pressure responsive actuating means engaged with said spherical valve member for rotating said spherical valve member between its open and closed positions upon relative longitudinal movement between said actuating means and said spherical valve member;

upper load transfer means, disposed between said upper annular seat and said housing means, for transferring an upward force caused by an upwardly directed pressure differential across said spherical valve member to said housing means by compressional loading of said upper load transfer means; and

lower load transfer means, disposed between said lower annular seat and said housing means, for transferring a downward force caused by a downward directed pressure differential across said spherical valve member to said housing means by compressional loading of said lower load transfer means

wherein in said pressure responsive well testing apparatus said housing means includes an internal downwardly facing upper support shoulder located above said spherical valve member and includes an internal upwardly facing lower

support shoulder located below said spherical valve member;

said upper load transfer means includes an upper load transfer mandrel having a lower end receiving said upper annular seat and having an upper end adapted to engage said upper support shoulder of said housing means, so that said upward force caused by said upwardly directed pressure differential across said spherical valve member is transferred by compression of said upper load transfer mandrel between said upper support shoulder and said upper annular seat;

said lower load transfer means includes a lower load transfer mandrel having an upper end receiving said lower annular seat and having a lower end adapted to engage said lower support shoulder of said housing means, so that said downward force caused by said downwardly directed pressure differential across said spherical valve member is transferred by compression of said lower load transfer mandrel between said lower support shoulder and said lower annular seat;

an annular cavity is defined between one of said upper and lower load transfer mandrels and said housing means;

said housing means includes an actuating means passage disposed longitudinally through a reduced internal diameter portion, thereof, one of said upper and lower support shoulders which is engaged by said one load transfer mandrel being defined on said reduced internal diameter portion of said housing means, said actuating means passage being located radially outward of said one support shoulder;

said actuating means includes an elongated actuating arm assembly extending longitudinally from said spherical valve member, through said annular cavity and through said actuating means passage; and

said pressure responsive well testing apparatus is constructed so that said actuating means is operated in response to longitudinal movement of said well test string.

4,624,318

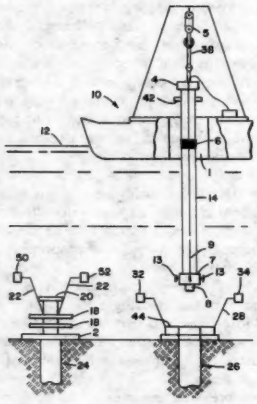
METHOD AND MEANS FOR STORING A MARINE RISER

Paul M. Aagaard, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 498,230, May 26, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 691,998

Int. Cl.[4] E21B *7/124, 33/043*

U.S. Cl. 166—359 **13 Claims**



1. A system for use in offshore drilling in seas where conditions may require moving the drilling vessel from location and which includes a marine riser extending from a primary borehole to the drilling vessel comprising;

a primary borehole being drilled to an extended depth into the seafloor;

wellhead means positioned above said primary borehole and in operable relationship therewith, said wellhead means including coupling means for detachably connecting a marine riser thereto;

a marine riser extending from a surface vessel to the primary borehole and disconnectably attached to said coupling means;

an auxiliary borehole having a depth substantially as deep as the length of said marine riser, said auxiliary borehole located closely adjacent to said primary borehole for receiving said marine riser when said marine riser is detached from said coupling means and is positioned above said auxiliary borehole;

draw works means on said drilling vessel, said draw works means for use in raising and lowering said marine riser and including a riser running tool disconnectably connectable to the upper end of said marine riser, and

control means on the lower end of said marine riser operable in cooperation with said draw works means to position the lower end of said marine riser respectively over said auxiliary borehole and to lower said marine riser into said auxiliary borehole when it is desired to store said marine riser in said auxiliary borehole and to remove said marine riser from said auxiliary borehole and to position the lower end of said marine riser over said wellhead means for connection with said coupling means when it is desired to reconnect said marine riser to said primary borehole.

4,624,319

METHOD AND APPARATUS TO IMPROVE WELL WATER QUALITY

Jacques A. Van Der Borght, 29, Rue du long Chêne, B-1970, Wezembeek-Oppem, Belgium, assignor to Jacques A. Van Der Borght, Wezembeek-Oppem, Belgium

Filed Dec. 18, 1984, Ser. No. 682,769

Int. Cl.[4] E21B *43/08;* **B01D** *23/06, 29/00*

U.S. Cl. 166—369 **19 Claims**

1. An apparatus for drawing water essentially free of sand from a well hole sunk in a sandy, water-bearing strata comprising:

a tubular suction control tail submerged in the water within the well hole and having a sidewall permeable to water along a major proportion of its length, an opening at the lower end of the tail to admit water and any sand suspended in the water into the tail and a hollow interior hydraulically coupled with water in the well hole through the permeable sidewall and through the opening;

pump means having an inlet hydraulically coupled with the hollow interior of the tail through an opening at the upper end of the tail and imposing suction through the inlet on the tail for drawing water at an operating rate through the permeable sidewall, the lower end opening and hollow interior of the tail; and

the suction control tail sidewall being of sufficiently large permeable area, sufficient length and sufficiently low permeability so that the rate of flow of water into the tail at each point along the permeable sidewall and at the lower open end under the operating rate suction of the pump means is less than a rate of flow necessary to overcome inertia of sand in the adjoining strata such that water flows into the tail essentially sand free.

15. An apparatus for drawing water essentially free of sand from a well hole sunk in a sandy, water-bearing strata comprising:

a pump having an inlet submerged beneath the water in the well hole;

a hollow, tubular suction control tail positioned beneath the pump inlet within the well hole and having a hollow interior hydraulically coupled with the pump inlet through an upper end opening, an open lower end admitting water and any suspended sand particles in the water into the interior of the tail and a porous sidewall having an absolute permeability in a portion of its length proximal the pump inlet lower than an absolute permeability in a portion of its length proximal the lower end opening of the tail.

4,624,320

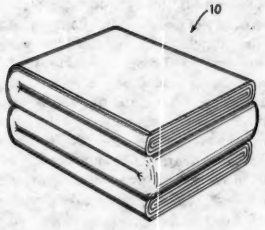
FIRE BLANKET

John W. Romaine, 58897 Cr 115, Goshen, Ind. 46516

Continuation-in-part of Ser. No. 568,852, Jan. 6, 1984, abandoned. This application May 14, 1984, Ser. No. 609,931

Int. Cl.⁴ A62C *7/00*

U.S. Cl. 169—50 **10 Claims**



1. In a fire-retardant appliance constructed from a sheetline fire-retardant material, the improvement wherein said fire-retardant material comprises:

a thin, flexible, sheetlike structure having length and width dimensions which are large relative to its thickness dimension, said structure consisting essentially of a thin, substantially planar, flexible, permeable substrate which is impregnated and filled with a non-toxic gel which is non-irritating to the human skin, said gel consisting essentially of gelled polyvinyl alcohol containing occluded water so that the gel is substantially self-supporting and has a solid-like consistency, said gel being formed by impregnating said substrate with an aqueous solution containing polyvinyl alcohol and the balance of the solution being essentially water, said polyvinyl alcohol being coagulated with a coagulating agent to insolubilize said polyvinyl alcohol and trap the water therein, said sheetlike structure defining enlarged opposite side surfaces, said gel substantially totally impregnating said permeable substrate and forming thin gel layers on opposite sides thereof which define said opposite side surfaces, and a thin and flexible film disposed in superimposed relationship to one of the side surfaces of said sheetlike structure.

4,624,321

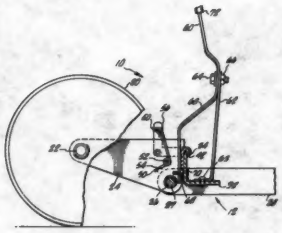
LAWN EDGER WHEEL MECHANISM

Ross E. Pinto, Redondo Beach, Calif., assignor to Tru-Cut, Inc., Los Angeles, Calif.

Filed Oct. 3, 1984, Ser. No. 657,374

Int. Cl.⁴ A01B *45/04*

U.S. Cl. 172—15 **18 Claims**



1. A wheel mechanism for supporting a lawn edger base at laterally selectable positions while providing corresponding clearance for an adjustable cutting blade of the lawn edger, the mechanism comprising:

(a) a supporting wheel slidably mounted to the base for lateral location of the wheel for clearing the blade;

(b) a detent member having at least three spaced discontinuities thereon for defining a corresponding number of lateral wheel positions;

(c) means for locking the wheel in a selected one of the lateral positions by engaging the detent member; and

(d) means for biasing the locking means into engagement with the detent member.

4,624,322

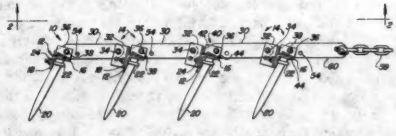
HARROW WITH LINK HAVING SPIKE SUPPORT ATTITUDE CONTROL

Terry L. Lowe, and John D. Long, both of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 4, 1985, Ser. No. 772,597

Int. Cl.⁴ A01B *19/00*

U.S. Cl. 172—620 **7 Claims**



1. In a harrow adapted for forward movement over the soil:

a plurality of transverse spike supports;

a plurality of spikes fixed to the supports; and

means connecting the spike supports in fore-and-aft spaced relationship, said means including a fore-and-aft extending flat link having a longitudinal axis and means for selectively connecting the link between adjacent spike supports in one of a plurality of positions, said link terminating at one end in structure for maintaining at least one of the supports in a preselected attitude with respect to the vertical, said attitude dependent on the selected link position, wherein said one end includes opposed edges angled with respect to the longitudinal axis at different angles and said link is rotatable about said axis to position a selected one of the edges adjacent said one of the spike supports, and

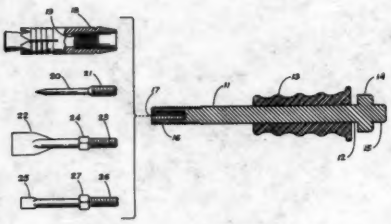
means for securing said selected one of the edges against said one of the spike supports to prevent substantial relative movement between the link and said spike support.

4,624,323

MULTI-PURPOSE IMPACT HAND TOOL KIT

Henry G. Burrola, 232 W. Pastime Rd., Tucson, Ariz. 85705

Filed Feb. 7, 1985, Ser. No. 699,047
Int. Cl.[4] B25D *17/00*; B21D *1/12*
U.S. Cl. 173—90 3 Claims



1. A multi-purpose, impact hand tool kit for driving a plurality of sizes of commercially available fastening devices such as, exterior threaded building fastening devices, interior threaded building fastening devices, and non-threaded impact end building fastening devices, said tool kit comprising:

(a) an elongated shaft, made of hardened material such as steel, provided with a tool end having thereat, exterior threads and a threaded bore, said exterior threads and said threaded bore being provided in a plurality of sizes for threadably attaching to said exterior threaded building fastening devices or to said interior threaded building fastening devices,

said elongated shaft further provided with a hammer impact end at its other end, a wrench head located below said hammer impact end and a shock absorbing handgrip secured to said elongated shaft and located below said wrench head;

(b) a first reducer adapter having one end provided with reduced exterior threads which will threadably attach to said threaded bore of said elongated shaft,

said first reducer adapter provided at its other end with a reduced tool end having thereat a reduced threaded bore, said reduced threaded bore being provided in a plurality of sizes for threadably attaching to said exterior threaded building fastening devices,

said first reducer adapter further being provided with a wrench head at said reduced tool end for torqueing of said first reducer adapter to said elongated shaft whereby continuity of elongated shaft axial strength is maintained;

(c) a second reducer adapter having one end provided with a first set of reduced exterior threads which will threadably attach to said threaded bore of said elongated shaft,

said second reducer adapter provided at its other end with a reduced tool end having thereat a second set of reduced exterior threads, said second set of reduced exterior threads beir.g provided in a plurality of sizes for threadably attaching to said interior threaded building fastening devices,

said second reducer adapter further being provided with a wrench head located between said first and second set of reduced exterior threads for torqueing of said second reducer adapter to said elongated shaft whereby continuity of elongated shaft axial strength is maintained; and

(d) a third reducer adapter having one end provided with reducer exterior threads which will threadably attach to said threaded bore of said elongated shaft,

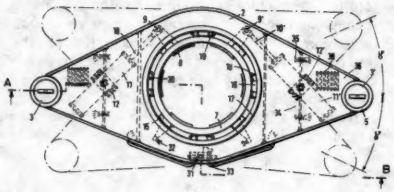
said third reducer adapter is provided at its outer end with a tool end comprised of a wrench head with a recessed bore, said recessed bore being provided in a plurality of sizes for holding said non-threaded impact end building fastening devices, said wrench head being provided for torqueing of said third reducer adapter to said elongated shaft whereby continuity of elongated shaft axial strength is maintained.

4,624,324

TURNING MECHANISM OPERATING ALTERNATELY IN OPPOSITE DIRECTIONS TO FACILITATE THE DRIVING IN OR EXTRACTING OF PILES

Hans Mathieu, Saarbrücken-Bischmisheim, and Jürgen Hochstrasser, Kobenhüttenweg 20, D-6600 Saarbrücken 3, both of Fed. Rep. of Germany, assignors to Elisabeth Hochstrasser nee Wack and Jürgen Hochstrasser, both of, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,264
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323475; Apr. 2, 1984, 3412659
Int. Cl.[4] B25D *15/00*
U.S. Cl. 173—93 10 Claims



1. A turning mechanism operating alternately in opposite directions to facilitate the driving in or extraction of piles or the like, comprising: a bearing rim fixed to said pile; a rocker arm having an inner flange carried by said rim for rotating about the pile axis and having two outwardly extending arms arranged symmetrically to the pile axis; a balance weight carried on each arm; a plurality of stop pairs arranged in series between the bearing rim and the inner flange of the rocker arm, the stop pairs having elements for transferring impact energy from the rocker arm to the bearing rim; at least two drive cylinders, whose casing and piston rods are articulated with respect to the bearing rim and the outwardly extending arms, such that one drive cylinder may be fully extended while another is compressed; a member made from a single elastic material having a low degree of compressibility at high impact loads received in recesses formed in at least one element of each of the stop pairs which permits a deformation within the elastic limit of the member, particularly at right angles to impact direction, and prevents direct contact between the stop pairs; wherein each stop pair comprises a first stop pair member, a projection integrally formed with the inner flange, the projection having a front face with a preferably arcuate recess for receiving the elastic member, and a lateral face in spaced relationship with the bearing rim; the elastic member having a front face capable of engaging a second stop pair member a first lateral face of the elastic member adjacent to the lateral face of the projection, the first lateral face of the elastic member in spaced relationship with the bearing rim to form a first air gap therebetween, a second lateral face of the elastic member in contact with the inner flange, an upper face perpendicularly disposed between the first and second lateral faces, a lower face parallel to the upper face; a bottom support plate fixed to the inner flange; a top cover plate fixed to the inner flange parallel to the bottom support plate the top cover plate and bottom support plate enclosing the elastic member to define a second air gap between the upper face of the elastic member and the top cover plate and a third air gap between the lower face of the elastic member and the lower face of the elastic member.

4,624,325
APPARATUS FOR DAMPENING THE RECOIL OF PERCUSSION TOOLS

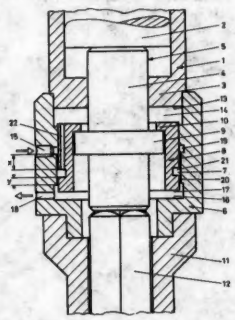
Heinz Steiner, Dörflingen, Switzerland, assignor to SIG Schweizerische-Industrie Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jul. 17, 1984, Ser. No. 632,192

Claims priority, application Switzerland, Jul. 21, 1983, 4010/83

Int. Cl.[4] B25D *17/24*

U.S. Cl. 173—139 **7 Claims**



1. A percussion tool comprising

(a) a housing;

(b) a tool bit movably supported by the housing for alternatingly executing forward and recoil strokes;

(c) a hammer piston supported in the housing and arranged for delivering consecutive blows at least indirectly to the tool bit for effecting the forward strokes thereof;

(d) means defining a dampening chamber in the housing;

(e) means for introducing fluid into said dampening chamber for generating a dampening effect therein;

(f) a dampening piston supported in said housing and bounding said dampening chamber; said dampening piston being arranged for reciprocating motion into and out of said dampening chamber;

(g) means connecting said tool bit with said dampening piston for effecting an axial displacement of said dampening piston into said dampening chamber by said tool bit during the recoil strokes thereof;

(h) control means carried by said dampening piston for varying the dampening effect of the fluid in said dampening chamber as a function of a relative axial displacement between said dampening piston and said housing;

(i) a first cylindrical portion of said housing being in a sliding engagement with said dampening piston;

(j) a second cylindrical portion of said housing defining, with outer surface portions of said dampening piston, a throttle gap having an axial length parallel to the reciprocating motion of said dampening piston; said throttle gap having an inlet throttle length portion and a discharge throttle length portion;

(k) axially spaced inlet and outlet ports provided in said housing for introducing and, respectively, discharging the fluid; said throttle gap maintaining fluid communication between said ports; and

(l) channel means provided in said dampening piston; said channel means having a first opening communicating with said dampening chamber and a second opening situated on an outer lateral surface of said dampening piston between said ports and communicating with said throttle gap; said second opening dividing said throttle gap into said inlet throttle length portion extending from said second opening toward said inlet port, and into said discharge throttle length portion extending from said second opening towards said outlet port; the length of said throttle length portions varying in opposite sense upon relative axial displacement between said dampening piston and said housing; said throttle length portions forming part of said control means.

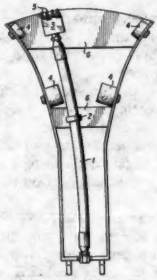
4,624,326
PROCESS AND APPARATUS FOR CUTTING ROCK

Charles Loegel, Jr., 27, rue du Chateau, F-67340 Lichtenberg, France

Filed Mar. 14, 1985, Ser. No. 711,497

Int. Cl.[4] E21B *7/18*

U.S. Cl. 175—67 **15 Claims**



1. A process for cutting rock which comprises discharging a medium under high pressure against said rock from a nozzle head on the free end of a single, flexible delivery line contained within and attached to the inlet end of a guide having stops, oscillating said nozzle head and said delivery line in a sweeping movement between said stops through the discharge of said medium itself directly through the delivery line and nozzle head.

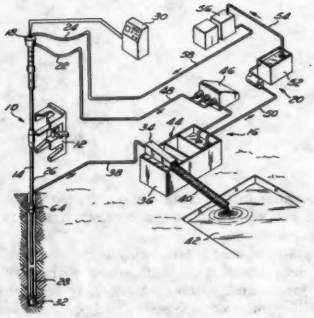
4,624,327
METHOD FOR COMBINED JET AND MECHANICAL DRILLING

James R. Reichman, Issaquah, Wash., assignor to Flowdril Corporation, Kent, Wash.

Filed Oct. 16, 1984, Ser. No. 661,368

Int. Cl.[4] E21B *7/18*

U.S. Cl. 175—67 **23 Claims**



1. A method for improving the rate of drilling a hole in an earthen formation, comprising:

(a) conducting a first fluid down said hole to said drill;

(b) conducting a second fluid down said hole to said drill;

(c) jetting said second fluid through openings in said drill

and against said formation to assist said drill in drilling, said second fluid being substantially clarified to prevent the clogging of said openings;

(d) mixing said first and second fluids substantially at the bottom of said hole;

(e) conducting the mixture of fluids back up the hole to the surface;

(f) segregating a portion of said fluid mixture to provide said second fluid, the remainder of said mixture serving as said first fluid;

(g) re-conducting said second fluid down said hole; and

(h) re-conducting said first fluid down said hole.

12. A system for drilling a hole in an earthen formation, comprising:

a. a drill bit;

b. a first substantially closed fluid circuit for circulating a drilling fluid stream;

c. a second substantially closed fluid circuit for circulating a second fluid stream;

d. at least one jet in said second fluid circuit adjacent said drill bit for directing a jet of said second fluid adjacent said drill bit;

e. said second fluid jet stream and said drilling fluid stream being effluent at said drill bit to form a common stream;

f. means for segregating a portion of said common stream; and

g. means for pressurizing said portion to a level greater than said common stream, said pressurized portion forming said second fluid jet stream.

4,624,328

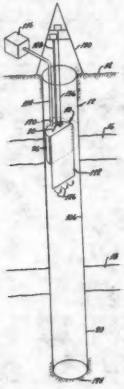
IN-SHAFT DRILLING APPARATUS FOR RECOVERY OF GAS FROM SUBTERRANEAN FORMATIONS

Walter L. Richards, Huntington Beach, Calif., assignor to Methane Drainage Ventures, Placentia, Calif.

Division of Ser. No. 618,473, Jun. 8, 1984. This application Sep. 6, 1985, Ser. No. 773,185

Int. Cl.[4] E21B 7/00

U.S. Cl. 175—78 **8 Claims**



1. Apparatus for drilling boreholes from a generally vertical shaft into a plurality of spaced-apart subterranean seams containing gas comprising:

a platform adapted for being suspended by a cable within a generally vertical shaft in the earth and further adapted for rotation within said generally vertical shaft;

drilling means, disposed on said platform, for drilling boreholes into subterranean seams containing gas;

stabilizing means for rigidly supporting said platform within said generally vertical shaft during the drilling of boreholes into subterranean seams containing gas, said stabilizing means being operative for releasing said platform to enable rotation of the platform and movement of the platform from one spaced-apart subterranean seam to another; and,

means comprising a curtain wall disposed along a diameter of the generally vertical shaft, for enabling fresh air to be circulated to and from the platform means, said platform being disposed on one side of said curtain wall during circulation of air to and from the platform.

4,624,329

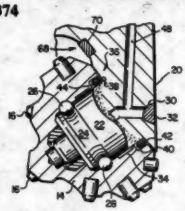
ROTATING CUTTER DRILL SET

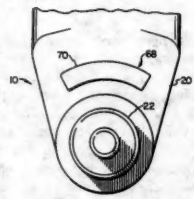
Robert F. Evans, and Randy C. Davis, both of Dallas, Tex., assignors to Varel Manufacturing Company, Dallas, Tex.

Continuation-in-part of Ser. No. 580,539, Feb. 15, 1984, abandoned. This application Jul. 5, 1985, Ser. No. 752,024

Int. Cl.[4] E21B 10/08

U.S. Cl. 175—374 **4 Claims**





1. A drill bit having protected sealing surfaces comprising:

a body having a cutter support and defining a sealing surface;

a cutter having cutting structure thereon and defining a sealing surface;

a bearing assembly for rotatably supporting said cutter on the cutter support of said body;

a seal assembly including a flexible seal member in sealed contact with said sealing surfaces on said body and cutter; and

a sacrificial anode for protecting the sealing surfaces, including a section of an annular ring secured to said body in the immediate area above said cutter support, proximal to the juncture of the body and the cutter support and within proximity of the sealing surfaces, said anode formed of a material higher in the electromotive series than the material forming the surrounding surfaces of said sealing surfaces, such that the sealing surfaces are rendered cathodic with respect to the anode and that the sealing surfaces are in close proximity to the anode during operation of said drill bit.

4,624,330

ROTARY DRILL BIT WITH STRAINER ELEMENT

Djurre H. Zijsling, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 25, 1985, Ser. No. 758,912

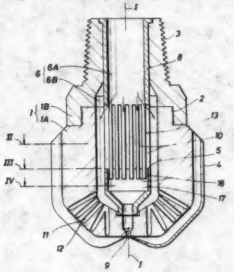
Claims priority, application Netherlands, Aug. 6, 1984, 8402431

Int. Cl.[4] E21B 10/60

U.S. Cl. 175—393 **8 Claims**

1. Rotary drill bit comprising a bit body having a chamber therein, jet fluid discharge nozzles operatively carried by said

bit body and extending through the wall of said bit, at least one fluid and particle discharge nozzle of a size larger than the jet nozzles and extending from the bit, a tubular strainer element coaxially mounted in said chamber in spaced relationship to the wall of the bit for the cleaning of drilling fluid flowing from a drill string, said strainer element having a cylindrical chamber form therein and an annular chamber outside thereof, adapted to be connected to the bit, to said jet fluid discharge nozzles arranged in the bit, wherein during drilling at least some of the drilling fluid flows in a substantially axial and downward direction through the annular chamber space enclosed by said element in communication with said particle discharge nozzle, the wall of said strainer element being provided with a number of fluid passages arranged to lead from said cylindrical chamber into a portion of the annular chamber portion of said bit chamber communicating with the jet nozzles and situated at the



outside of the strainer element and which consist, at least at the fluid inlet side situated on the inside of the element, of substantially axially extending slots extending a distance over the major length of said annular chamber, characterized in that the inside of the wall of the part of the strainer element situated immediately underneath each slot during drilling is of a greater diameter for a selected axial distance downwardly than the inside of the wall of the strainer element at the point adjacent the lower end of the slot located above.

4,624,331
WEIGHT SENSOR WITH VIBRATION ERROR CORRECTION

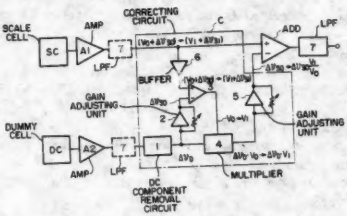
Kazufumi Naito, Ohtsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Dec. 28, 1984, Ser. No. 687,174

Claims priority, application Japan, Dec. 28, 1983, 58-251706; Aug. 1, 1984, 59-162694

Int. Cl.⁴ G01G *23/10, 19/00*

U.S. Cl. 177—185 **4 Claims**



1. A weight sensor comprising:

a scale cell for producing an output signal corresponding to the weight of an article to be weighed, said output signal having a DC component and a floor vibration component;

a dummy cell positioned adjacent said scale cell for producing a noise signal output ascribable to floor vibration;

a correcting circuit, operatively connected to said scale cell and said dummy cell, for extracting a signal proporational to the DC component contained in the output signal of said scale cell and for correcting, on the basis of the extracted signal, the noise signal output of said dummy cell, so that the noise level of the corrected noise signal output corresponds to the noise level of the floor vibration component of said scale cell, said correcting circuit including:

first gain adjusting means for establishing agreement between the noise level of the noise signal output of said dummy cell and the noise level of the floor vibration component of the output signal of said scale cell in the absence of the article to be weighed, and for providing an adjusted noise signal output;

adding means for adding, in opposite-phase relation, the adjusted noise signal output of said dummy cell and the output signal of said scale cell, to produce, as an added output signal, the DC component contained in the output signal of said scale cell;

multiplying means for multiplying the added output signal of said adding means and the noise signal output of said dummy cell to provide a multiplied output signal having an output level; and

second gain adjusting means for generating the corrected noise signal output of said dummy cell by bringing the output level of said multiplying means into agreement with the noise level of the floor vibration component of said scale cell; and

an adder, operatively connected to said scale cell and said second gain adjusting means, for adding, in opposite-phase relation, the corrected noise signal output of said dummy cell and the output signal of srid scale cell.

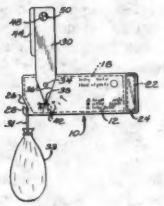
4,624,332
SPECIAL PURPOSE SCALE

Richard P. Mills, Ft. Atkinson, Wis., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 3, 1984, Ser. No. 677,268

Int. Cl.⁴ G01G *1/02, 1/28*

U.S. Cl. 177—224 **4 Claims**

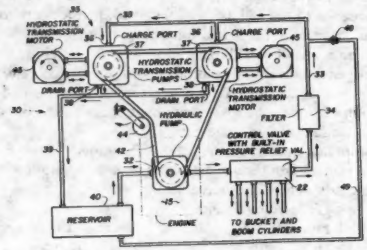


1. A balance-type scale comprising a relatively elongated substantially flat body of resinous plastic material having front and back faces and a first end and a second end, means adjacent said first end for supporting a subject to be weighed, weight means of preselected mass embedded within said plastic material adjacent to said second end for counter-balancing a subject to be weighed, a substantially rigid suspension member of resinous plastic material, means relatively adjacent said first end of said body for pivotally supporting said body from said suspension member, said suspension member having like front and back spaced apart plates spaced apart by a spacer and respectively lying adjacent said front and back faces and said supporting means engaging and being embraced by both plates, said suspension member and said body having cooperating pointer and indicia means thereon for mutual cooperation to indicate the weight of the subject being weighed, said plates having aligned holes therein through which an object such as a pencil may extend to support said suspension member, at least one face of said body having a protuberance thereon for receipt in one of said holes when said suspension member is pivoted into substantially aligned position with said body to retain said suspension member in said substantially aligned position.

4,624,333
METHOD AND APPARATUS FOR STARTUP OF A HYDROSTATIC TRANSMISSION

Ray C. Minor, Abingdon, Va., assignor to New Holland, Inc., New Holland, Pa.

Filed Aug. 30, 1984, Ser. No. 645,590
Int. Cl.[4] B62D *11/02*
U.S. Cl. 180—6.48 8 Claims



1. In a skid-steer loader having a main body frame; wheel assemblies mounted on opposing sides of said main frame to mobilely support said main frame; a hydrostatic transmission operatively associated with said wheel assemblies to provide rotational power thereto, said hydrostatic transmission having an inlet line for the introduction of hydraulic fluid thereto and a return line for the discharge of hydraulic fluid therefrom; an engine mounted on said main frame to provide a source of primary power; a boom structure movably mounted on said main frame and provided with means for attaching work implements, said boom structure and said means for attaching being movable by hydraulic actuators having inlet and return lines for the flow of hydraulic fluid therethrough; and a hydraulic system operatively interconnecting said engine, said hydrostatic transmission and hydraulic actuators for the supplying of hydraulic fluid under pressure to said hydrostatic transmission and said hydraulic actuators to effect operation thereof, the operation of said hydraulic actuators to move said boom structure and said means for attaching work implements causing the hydraulic fluid effecting operation thereof to be warmed, the improvements comprising:

said hydraulic system directing the flow of hydraulic fluid from the return line of said hydraulic actuators to the inlet lines of said hydrostatic transmission so that hydraulic fluid warmed through operation of said hydraulic actuators can be used to warm the hydraulic fluid within said hydrostatic transmission prior to operating said hydrostatic transmission, said hydrostatic transmission including drive means for operatively connecting said hydrostatic transmission to said engine to transfer power therebetween, said drive means being disengageable to permit said engine to be operated without effecting operation of said hydrostatic transmission.

4,624,334
ELECTRIC POWER ASSISTED STEERING SYSTEM

William L. Kelledes, Brighton, and Walter K. O'Neil, Birmingham, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 30, 1984, Ser. No. 646,371
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 11 Claims

1. An electrical power assisted steering system for a vehicle comprising:

operator controlled means for steering the vehicle;

a steering shaft connected between the operator controlled means and at least one steerable wheel of the vehicle;

a voltage source having a first and second terminal, said first terminal being at a higher voltage than said second terminal, and a center tap;

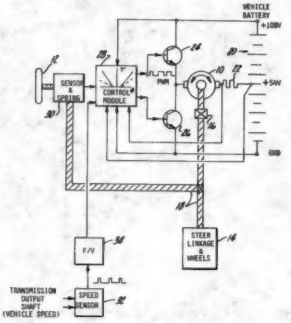
a bi-directional electrical motor having two terminals, one terminal being connected to the center tap of the voltage source, for providing additional torque to the steering shaft;

means for coupling the motor to the steering shaft;

sensor means for generating a signal indicative of the displacement and rotation of the operator controlled means by an operator; and

control means for controlling the operation of the motor in response to signals from the sensor means, the control means including

a first switching means electrically connected between the first terminal of the voltage source and the other terminal of the motor for selectively energizing the motor to turn in a first direction to thereby provide power assisted steering in said first direction,



a second switching means electrically connected between said other terminal of the motor and the second terminal of the voltage source for selectively energizing the motor to turn in a direction opposite to said first direction to thereby provide power assisted steering in said opposite direction, and

a means for generating pulse width modulated signals selectively to either the first or second switching means, said first and second switching means being responsive to the pulse width modulated signals to energize the motor to turn in proportion to the width of the pulse signals.

4,624,335
FAIL SAFE STEERING EFFORT CONTROL SYSTEM

Yasuhiro Shiraishi, Zama, and Makoto Miyoshi, Kawasaki, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 12, 1984, Ser. No. 660,154
Claims priority, application Japan, Oct. 13, 1983, 58-189821
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—142 4 Claims

1. A fail safe steering effort control system for vehicle power steering comprising:

means for sensing at least one variable of a condition of the vehicle,

an actuator for varying a steering effort,

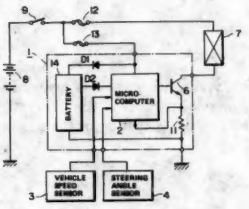
main control means, connected with said sensing means, for regulating said actuator by regulating a current for driving said actuator thereby generating a control signal to control the steering effort in accordance with the variable,

a main battery connected with said main control means through a first power circuit, and connected with said actuator through a second power circuit,

a first fuse inserted in said first power circuit,

a second fuse inserted in said second power circuit so that said actuator can be supplied with power from said main battery even when said first fuse opens said first power circuit, and

emergency control means, connected with said actuator, for providing said actuator with an emergency control signal to control the steering effort in a predetermined manner when the supply of power of said controller is stopped, said emergency control means also connected with said main battery through said first and second power circuits so that said emergency control means is an emergency state and is supplied with power from said main battery via said second power circuit and generates said emergency control signal when said first fuse opens said first



power circuit, and said emergency control means is in a normal state to allow normal operation of said main control means when said main control means is supplied with power from said main battery through said first power circuit;

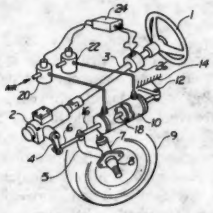
wherein said emergency control means comprises a current determining resistor means connected with said actuator for determining a fixed value of current supplied by said main battery to said actuator, a switching means connected in series with said current determining resistor means, and an operating means connected with said first power supply circuit for holding said switching means in an open state when said emergency control means is in the normal state and for providing said fixed value of current for driving said actuator in the emergency state.

4,624,336

ELECTRO/PNEUMATIC POWER STEERING SYSTEM

William C. Eddy, West Bloomfield, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 13, 1984, Ser. No. 670,688
Int. Cl.[4] B62D 5/04
U.S. Cl. 180—142 **17 Claims**



1. In combination with an automotive vehicle having source of pressurized air, a steering wheel, a gear box having a Pitman arm, a steering column connected between the steering wheel and the gear box, and a pair of steering knuckles, each having an axle rotatably supporting the vehicle's road wheels and a steering arm mechanically linked to the Pitman arm, an electro/pneumatic power steering system comprising:

a torque sensor for generating a torque signal indicative of the direction and magnitude of the torque applied to the steering column to turn the vehicle's road wheel;

controller means responsive to said torque signal for generating a first signal having a value indicative of the magnitude of the torque applied to the steering column to turn the vehicle's road wheels in a first direction and a second signal having a value indicative of the magnitude of the torque applied to the steering column to turn the vehicle's road wheels in the opposite direction;

a pneumatic cylinder connected between the vehicle's frame and one of the steering arms;

a first electro/pneumatic valve connected between the vehicle's source of pressurized air and the pneumatic cylinder, said first electro/pneumatic valve having a first state venting said pneumatic cylinder to the atmosphere and a second state in response to said first signal for providing air to said pneumatic cylinder at a pressure proportional to the value of said first signal, causing said pneumatic cylinder to apply a force to the steering arm urging the steering knuckle to pivot in the direction of the applied torque; and

a second electro/pneumatic valve connected between the vehicle's source of pressurized air and the pneumatic cylinder, said second electro/pneumatic valve having a first state venting said pneumatic cylinder to the atmosphere and a second state in response to said second signal for providing air to said pneumatic cylinder at a pressure proportional to the value of said second signal causing said pneumatic cylinder to apply a force to the steering arm urging the steering knuckle to rotate in the direction of the applied torque;

wherein said torque sensor generates a torque signal having a polarity indicative of the direction component of the applied torque and an amplitude component indicative of the magnitude of the applied torque;

wherein said controller comprises;

first means responsive to said torque signal having a first polarity to generate said first signal; and

second means responsive to said torque signal having an opposite polarity for generating said second signal; and

a saw tooth generator means for generating a saw tooth wave having an amplitude increasing with time, including offset means for biasing said torque signal to generate a biased input signal such that the magnitude component corresponds to a zero magnitude having a midpoint value, means for generating a saw tooth wave having a predetermined repetition rate, dead band generator means for generating a clipping signal having a predetermined value, and a clipping amplifier responsive to said saw tooth wave and said clipping signal for generating a clipped saw tooth wave in which minimum value of said saw tooth wave is limited to said predetermined value;

said first means comprises a first comparator for comparing the amplitude of said torque signal with the amplitude of said saw tooth wave to generate said first signal in the form of a first pulse train signal each pulse of said first pulse train signal having a pulse duration corresponding to the amplitude of said torque signal and where said second means comprises an inverter for inverting the polarity of said torque signal having said opposite polarity and a second comparator for comparing amplitude of said inverted polarity torque signal with the amplitude of said saw tooth wave to generate said second signal in the form of second pulse train signal, each pulse of said second pulse train signal having a duration corresponding to the amplitude of said inverted polarity torque signal.

4,624,337

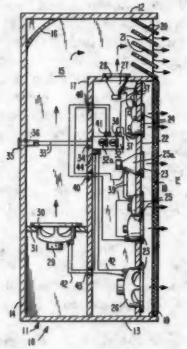
SPEAKER ENCLOSURE

Glynn S. Shavers, 22 Hosmer St., Mattapan, Mass. 02126

Filed Oct. 2, 1985, Ser. No. 782,991
Int. Cl.[4] H05K 5/00
U.S. Cl. 181—145 **4 Claims**

1. A speaker enclosure for an audio system, comprising, in

combination, a housing and a plurality of speakers contained within said housing, said housing comprising a top wall, a bottom wall, a rear wall and a pair of opposite side walls, an inverted "L"-shaped divider wall therewithin having a vertical leg and a horizontal leg extending to a front edge of said housing to divide an interior of said housing into a front lower compartment and a rear compartment therebehind extending in an "L"-shaped thereabove, a front wall closing a front of said front lower compartment and a mesh grill spaced forwardly of said front wall, a plurality of equally spaced apart, horizontal louvers across a front opening of said rear compartment located above said grill, said louvers being pivotally mounted for selective vertically directly sound waves therebetween, a concave baffle across and closing an upper rear corner of said rear compartment, and edges of all said walls fixedly abutting those of said walls that are located adjacent



thereto; said plurality of speakers comprising a pair of tweeters, a tweeter horn, a pair of mid-range speakers, a mid-range horn, a first woofer, a second woofer and a cross-over unit; a plurality of openings through said front compartment front wall, said pair of tweeters, said pair of mid-range speakers, said mid-range horn and said first woofer being mounted in said openings facing forwardly, an opening in said divider horizontal leg and said tweeter horn being mounted therein facing upwardly toward an upper forwardly extending portion of said rear compartment behind said louvers; a horizontal support wall in said rear compartment being spaced elevated from said bottom wall and including an opening in which said second woofer is mounted facing upwardly to deliver sound waves toward said baffle and thence forwardly past said tweeter horn toward said louvers and pushing before them high frequency sound waves produced by said tweeter horn.

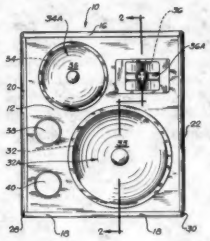
4,624,338

LOUDSPEAKER ENCLOSURE FOR A VIBRATING DIAPHRAGM LOUDSPEAKER

Gary T. Ewald, South Bend, Ind., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Feb. 1, 1985, Ser. No. 697,321
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—148 **7 Claims**

1. A loudspeaker system comprising, in combination, a plurality of walls mounted together to form a hollow enclosure, the enclosure having an opening in one wall thereof, a loudspeaker having a diaphragm, the diaphragm being mounted on the enclosure confronting the opening in the wall and being acoustically sealed to the wall about the opening characterized by the construction wherein the walls of the enclosure consist of a plurality of layers disposed between one surface of the wall and another surface of the wall, each layer being contiguous to adjacent layers, each layer comprising a plurality of elongated strands of wood embedded in a mass of solid resin, each strand having an axis of elongation and a shorter transverse axis normal thereto, the axes of elongation of the strands in a layer adjacent to the one surface being generally parallel to a common plane and generally parallel to each other, and the



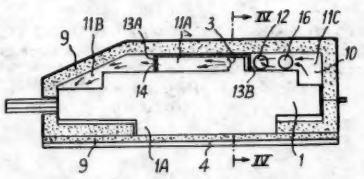
strands in the layer adjacent to said layer having their axes of elongation generally parallel to the same plane and generally normal to the axis of elongation of the strands in said layer.

4,624,339

SOUND-PROOFING CASING FOR A PNEUMATIC PERCUSSIVE DRILL

Frédéric E. Marcel, Verneuil-En-Halatte, and Francois J. M. Maume, Pont-Ste-Maxence, both of France, assignors to Charbonnages de France, Paris, France

Filed Nov. 2, 1984, Ser. No. 667,735
Claims priority, application France, Nov. 10, 1983, 83 17900
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—230 **8 Claims**



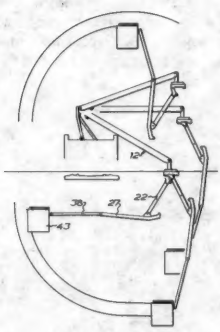
1. A casing for pneumatic drill of the type having an air exhaust orifice, said casing containing substantially the entire pneumatic drill and comprising at least two portions with each portion being removably attachable to the other portion, each portion having an internal surface provided with absorbent material, said absorbent material of one of said portions supporting the drill, said casing entirely surrounding and enclosing the drill and having a wall being provided with an outlet opening for exhaust air which, with a pneumatic drill placed in said casing, the exhaust orifice of the drill will be remote from said opening, said casing defining together with a drill disposed therein, an internal volume, said internal volume being divided between the exhaust orifice of the drill and said opening by transverse partition means into at least two successive chambers having passage means communicating therebetween, said chambers being disposed adjacent to one another along the length of the drill.

4,624,340

MOBILE WORKING PLATFORM

Jan Aström, Osby, and Gunnar Eriksson, Älmhult, both of Sweden, assignors to AB Sjölanders Smides & Mek. Verkstad, Osby, Sweden

Filed Nov. 5, 1985, Ser. No. 795,126
Claims priority, application Sweden, Nov. 16, 1984, 8405743
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—2 3 Claims



1. A mobile working platform for inspecting and carrying out work on the underside of bridges, a so-called under-bridge lift, comprising

(a) a boom,

said boom being of parallelogram type and having its one end horizontally and vertically pivoted to support means which are secured to a vehicle;

(b) an arm assembly,

said arm assembly comprising an inner arm whose inner end is horizontally and vertically pivoted to the boom end facing away from said support means, an outer arm whose outer end is vertically pivoted to a cage, and at least one intermediate arm vertically pivoted at its opposite ends to said inner and outer arms;

(c) hydraulic motors, including piston and cylinder assemblies to provide movement of said arms and boom relative to each other and to the vehicle;

(d) means to maintain said cage substantially horizontal independently of the angle of inclination of said boom and said arms;

(e) a turntable,

said turntable being rotatably attached, by means of a hydraulic motor, to the boom end facing away from said support means;

(f) an angular arm end portion on said inner arm, by means of which said inner arm is mounted on said turntable adjacent to the circumference thereof and which extends inwardly to the centre of the turntable on the underside thereof, said piston and cylinder assembly for operating said inner arm also being mounted on the turntable adjacent to the circumference thereof diametrically opposite the mounting point of said angular arm end portion and engaging said inner arm between the ends thereof;

(g) at least one control rod,

said rod being mounted radially outside the mounting point of said inner arm end portion on said turntable;

(h) a pivot axis at the outer end of said inner arm, to which pivot axis said control rod is connected as well as the inner end of said intermediate arm; and

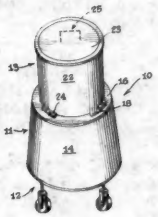
(i) a motion transfer system on said intermediate arm and said outer arm, the outer end of said control rod and said cage, respectively, being connected to the opposite ends of said system.

4,624,341

ELEVATABLE STOOL CONSTRUCTION

David B. Lee, 2375 Tipperary Ave., South San Francisco, Calif. 94080

Filed Sep. 3, 1985, Ser. No. 771,760
Int. Cl.[4] E04G *3/16*
U.S. Cl. 182—15 3 Claims



1. An extensible foot stool apparatus comprising:

a generally conical housing member having an enlarged opening formed on its bottom end, and a relatively smaller opening formed on its top end; and

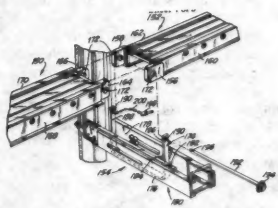
a generally elongated cylindrical extension member having an enlarged support surface formed on its upper end, wherein the extension member is slideably disposed within said housing member, and further provided with temporary securing means on its lower end which releasably engage the upper portion of the housing member; wherein, the housing member is further provided with an inwardly extending shoulder element surrounding said relatively smaller opening on said top end.

4,624,342

SCAFFOLDING PLATFORM

Carl E. Anderson, 12 St. Stephens Pl., Staten Island, N.Y. 10306

Division of Ser. No. 714,931, Mar. 22, 1985, Pat. No. 4,598,794.
This application Apr. 2, 1986, Ser. No. 847,211
Int. Cl.[4] E04G *5/08*
U.S. Cl. 182—223 4 Claims



1. An interconnected scaffolding platform, comprising:

at least two elongated staging sections to be butted together and supported on a support member having a vertical receiving slot therein with a transverse stop thereacross;

a pair of end portions longitudinally projecting from the confronting ends of each section, each pair being staggered with respect to the other pair, so as to permit a mating interfit of the two pairs of end portions;

each of said end portions having a transverse bore therethrough, said bores being aligned in the interfit position of the end portions so as to define a passageway transverse to the sections, and

coupling means for extending through said passageway to securely interconnect said sections together, whereby the interconnected sections will lie colinearly in a common plane, said coupling means comprising a U-shaped bar

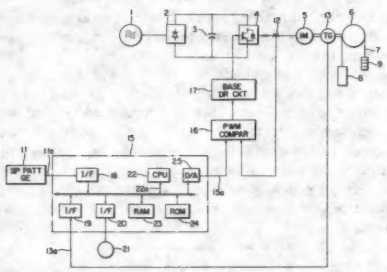
having a bight portion and a pair of legs, said legs upwardly projecting through said slot so as to straddle said end portions with said bight portion restrained by the transverse stop, aligned bores formed in the distal ends of said legs, a bolt extending through said aligned bores and said passageway, and enlarged head at one end of said bolt preventing complete passage through said aligned bores, a transverse hole at the other end of the bolt, and pin means slidably insertable into the transverse hole for preventing removal of said bolt.

4,624,343

SPEED CONTROL APPARATUS FOR ELEVATOR

Tooru Tanahashi, Gifu, and Yoshio Miyanishi, Nagoya, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,311
Claims priority, application Japan, Feb. 29, 1984, 59-38211
Int. Cl.[4] H02P 7/36
U.S. Cl. 187—29 R 9 Claims



1. In a speed control apparatus for an elevator having a speed pattern generator which generates a speed command of the elevator, a current detector which detects current to be supplied to an induction motor for hositing the elevator, a speed detector which detects a rotational speed of the induction motor, and a pulse width modulation comparator which compares and operates the respective outputs of the speed detector and the speed pattern generator and which compares the comparison value with the output of the current detector so as to generate a pulse width modulation command for controlling the speed of the induction motor; a speed control apparatus for an elevator comprising a control signal generating circuit which sends said pulse width modulation comparator a control signal for limiting an operating period of time on the basis of the output of said current detector so as to render a load time factor a predetermined value or less.

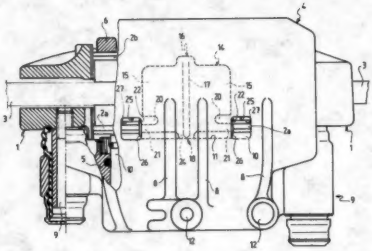
4,624,344

SPRING FOR THE PADS OF A DISC BRAKE WITH SLIDING CALIPER, AND DISC BRAKE EQUIPPED WITH SUCH A SPRING

Jean-Louis Gerard, Paris, and Claude Le Marchand, Domont, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Apr. 17, 1985, Ser. No. 724,143
Claims priority, application France, Apr. 26, 1984, 84 06584
Int. Cl.[4] F16D 65/02
U.S. Cl. 188—73.36 6 Claims

1. In a sliding caliper disc brake having an arch overhanging a pair of brake pads spaced axially apart from one another and a spring resiliently engaging the brake pads, the spring interposed between the arch and brake pads to push the brake pads in a radial direction away from the arch, the spring comprising a metal sheet folded in the general shape of a V and incorporating a pair of main lateral wings which bear at respective free ends against an inside surface of the arch, the main lateral wings joined by an axial central portion in bearing engagement with the pair of brake pads, and a pair of lateral mounting wings extending from the central portion and having free ends elastically engaging the arch in respective openings in the arch, the lateral mounting wings provided adjacent a first axial end of the spring and comprising axial extensions of the respective main lateral wings, each associated main lateral wing and lateral mounting wing being disposed at least partly in a plane emanating from the central portion, each lateral mounting wing having at a free end thereof hook means resiliently engaging said arch in the respective opening and extending in an axial direction toward a second axial end of the spring, the central portion projecting axially beyond the lateral mounting



wings to form the first axial end of the spring, each lateral mounting wing separated from the associated main lateral wing by a notch extending circumferentially inwardly, relative to the disc, through a portion of the transverse width of the respective main lateral wing in order to provide an axial separation between the lateral mounting wing and main lateral wing, the first axial end engaging resiliently a radial surface of the caliper so that the resilient engagement between each hook means of a free end and the respective arch and the engagement of the first axial end with the radial surface effect a moment to the spring to maintain the free ends of the main lateral wings in resilient engagement with the inside surface of the arch.

4,624,345

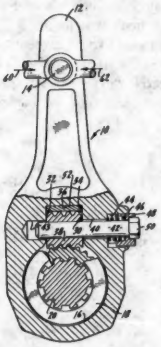
VEHICLE SLACK ADJUSTERS

Arthur A. Berg, Northbrook, and Frederic Lissau, Chicago, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Continuation-in-part of Ser. No. 598,487, Apr. 9, 1984, abandoned. This application Jul. 13, 1984, Ser. No. 630,771
Int. Cl.[4] F16D 65/46
U.S. Cl. 188—196 M 24 Claims

1. In a slack adjuster for use in a transportation environment, a body having a lever arm, a passage in said body, and a worm gear wheel for mounting on a brake shaft positioned in said body passage, a slot formed in said body and opening into the passage, said slot having three mutually perpendicular surfaces, one end surface and two side surfaces, and being of a size and shape to hold a worm gear and providing for threaded engagement of said worm gear wheel and worm gear, a bore in said body and generally perpendicular to at least one of said slot surfaces, a shaft positioned in said bore and coaxially mounting said worm gear for adjustment thereof, said bore being oversized relative to said shaft and providing little or no

bearing support therefor whereby when a torque is applied to said worm gear wheel resulting from a force applied to the



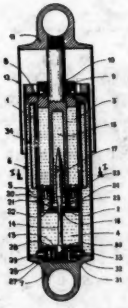
lever arm, the worm gear exerts forces normal to two of the surfaces of the slot.

4,624,346

MULTI-RATIO HYDRAULIC ENERGY DISSIPATER

Maurice Katz, Paris, France, assignor to Creusot-Loire, Paris, France

Filed Jul. 12, 1984, Ser. No. 630,169
Claims priority, application France, Jul. 20, 1983, 83 11941
Int. Cl.[4] F61F 9/50; B60G 17/08
U.S. Cl. 188—282 **5 Claims**



1. Hydraulic energy dissipater providing different braking ratios particularly intended for the braking of yaws of bogies, comprising

(a) a working cylinder filled with fluid and divided into upper and lower chambers by a piston, said piston being carried by a piston rod and being provided with two sets of valves, each set allowing the fluid to pass from one of said chambers to the other and comprising at least one first valve strongly loaded by a calibrated spring and one second valve weakly loaded by a calibrated spring;

(b) an annular compensating chamber surrounding said working cylinder and communicating through a valve and a loaded valve with said lower chamber so as to enable fluid to pass between said compensating chamber and said lower chamber upon attainment of predetermined pressures; and

(c) a member mounted on the bottom of said working cylinder and penetrating through a bore provided on the bottom of said piston into a chamber provided inside said piston rod, said member comprising portions of at least two different cross-sections, the first of said cross-sections being equal to that of said bore, the second of said cross-sections being less than that of said bore, said portion having said first cross-section being moved into positions respectively blocking and opening said bore by traction and compression forces applied to said dissipator;

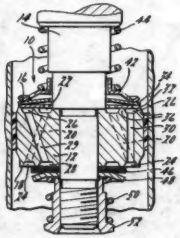
(d) whereby said fluid is forced to pass through said at least one strongly loaded valve when said piston moves in a predetermined portion having said first cross-section centered on the initial position of said piston, a high braking ratio being then obtained, and to force it to pass through said at least one weakly loaded valve when said piton moves in a portion different from said predetermined portion, a low braking ratio being then obtained.

4,624,347

PISTON ASSEMBLY FOR SHOCK ABSORBER

Jack W. Mourray, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 573,274, Jan. 23, 1984, abandoned. This application Nov. 14, 1985, Ser. No. 797,770
Int. Cl.[4] F16F 9/34
U.S. Cl. 188—322.15 **3 Claims**



1. A piston assembly for a shock absorber comprising:

(A) a generally cylindrical body attached to a piston rod and having

(i) upper and lower faces,

(ii) outboard and inboard annular grooves on each of said upper and lower faces,

(iii) first means comprising ports connecting said upper inboard annular groove with said lower outboard annular groove for conducting hydraulic fluid through said generally cylindrical body during all compression and rebound strokes,

(iv) second means comprising ports connecting said upper outboard annular groove with said lower inboard annular groove for conducting hydraulic fluid through said generally cylindrical body during all compression and rebound strokes;

(B) first and second annular discs mounted abuttingly to the upper face of said cylindrical body wherein:

(i) said first annular disc is more proximate the upper face of said cylindrical body and has a notch in its outer periphery whereby fluid may pass through said ports of said second means,

(ii) said first annular disc has a central opening larger than the diameter of said piston rod whereby fluid may pass between said piston rod and said first annular disc,

(iii) said second annular disc is of dished shape and is superimposed upon said first annular disc such that the outer periphery of each annular disc is in contact with the other, and

(iv) said second annular disc is of flexible material such that said second annular disc will progressively flatten in response to fluid pressure acting above said piston assembly whereby rebound flow through said first means becomes constricted and rebound flow is caused

to change its course from primarily said first means to primarily said second means;

(C) a retainer clampingly engaged with the outer periphery of said second annular disc, said retainer being axially loaded in the direction of said second annular disc by means of a compression spring; and

(D) a rebound disc stack comprised of at least one resilient disc clampingly and abuttingly engaged with said lower face of said cylindrical body whereby flow through said ports of said second means is resiliently resisted, said at least one resilient disc further comprising at least one notch in its outer periphery whereby hydraulic fluid may pass into and out of said inboard annular groove when said notched disc is in bridging contact with said inboard annular groove.

4,624,348

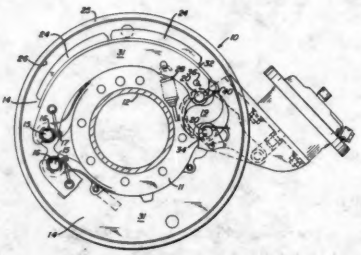
ROLLER RETAINER FOR BRAKE ASSEMBLY

William J. Williams, Lake Orion, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 108,447, Dec. 31, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,574

Int. Cl.⁴ F16D *51/22*

U.S. Cl. 188—330 **6 Claims**



1. In a rotary cam actuated vehicle brake assembly including a pair of brake shoes with each brake shoe having a pair of spaced parallel webs, a rotary cam between adjacent ends of said brake shoes, and a roller type cam follower between said cam and said adjacent end of at least one of said brake shoes said cam follower having a pair of trunnions seated in open recesses provided at the end of said one brake shoe webs, the improvement comprising:

a roller retainer member secured to said one brake shoe and having a manual grip and two substantially parallel legs, said manual grip and said legs located on one side of a reference plane parallel to said legs and passing through the axis of said cam follower and a portion of said member intermediate at least one of said legs and said manual grip on the other side of said reference plane formed to extend only partly around the circumference of a roller trunnion surface.

4,624,349

METHOD AND APPARATUS FOR CONTROLLING AN ELECTROMAGNETIC CLUTCH FOR USE ON A VEHICLE

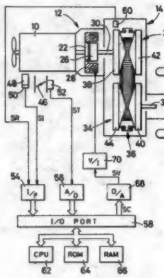
Tomoyuki Watanabe, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 25, 1984, Ser. No. 654,021

Int. Cl.⁴ F16D *37/02;* **B60K** *41/02*

U.S. Cl. 192—0.076 **10 Claims**

1. A method of controlling an electromagnetic clutch of the magnetic powder type which is incorporated in a power transmission system of a vehicle to transmit an output of an engine to drive wheels, and which includes a driving rotary member operatively connected to said engine, a driven rotary member operatively connected to said drive wheels and cooperating with said driving rotary member to define an annular space therebetween, a mass of magnetic powder accommodated in said annular space, and a solenoid to be energized for bonding together particles of said magnetic powder such that said mass of magnetic powder transmits a torque of the engine to the drive wheels, a clutch torque to be transmitted from said driving rotary member to said driven rotary member being varied as a function of an electric current to energize the solenoid, so that the clutch torque is increased with an actual speed of the



engine during the engaging action of the clutch, said method comprising the steps of:

detecting a currently required output of said engine during a period of said engaging action of said elecromagnetic clutch; and

changing a rate of increase in said electric current relative to said actual speed of the engine, such that said rate of increase is increased as said required output of the engine is decreased.

4,624,350

GEAR SHIFT DEVICE FOR VEHICLES

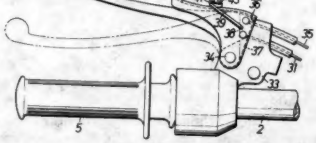
Tomohiko Akashi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1984, Ser. No. 649,447

Claims priority, application Japan, Sep. 17, 1983, 58-171496

Int. Cl.⁴ B60K *41/26;* **F16H** *57/06;* **B62K** *3/06*

U.S. Cl. 192—4 C **4 Claims**



1. A gear shift device for vehicles of the type including a gear shift drum having a guide groove for reverse speed stage formed thereon, the reverse guide groove being fitted with a reverse shift fork, the gear shift device comprising a rotation inhibiting member for inhibiting rotation of the gear shift drum to a reverse position, the rotation inhibiting member being displaceably disposed between a rotation inhibiting position and an inhibition releasing position and being normally urged toward the rotation inhibiting position, and a remote control member incorporated in a brake actuating system and operated in such a manner that it is allowed, only when a vehicle is braked, to displace the rotation inhibiting member from the rotation inhibiting position to the inhibition releasing position said remote control member being mounted together with a brake lever on a steering handle at a position near a grip in a

turnable manner in the same direction as that of the brake lever, said remote control member being adapted to turn so as to allow the rotation inhibiting member to be displaced to the inhibition releasing position only when said brake lever is caused to turn for braking operation.

4,624,351

FRICTION DISC CLUTCH FOR A MOTOR VEHICLE

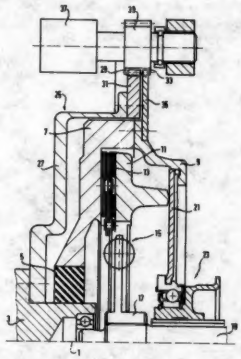
Dieter Lutz, Schweinfurt, and Wolfgang Thieler, Hassfurt-Uchenhofen, both of Fed. Rep. of Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 11, 1984, Ser. No. 679,636

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345541

Int. Cl.[4] F16D *47/02, 3/12;* F16F *15/12;* F02N *11/00*

U.S. Cl. 192—48.5 3 Claims



1. A friction disc clutch for a motor vehicle driven by an inte nal combustion engine comprising:

(a) a flywheel driveable in rotation by the internal combustion engine about a rotation axis;

(b) a clutch cover held on the flywheel;

(c) a presser plate connected non-rotatably but axially displaceably with the flywheel;

(d) a clutch disc provided with friction linings axially between the flywheel and the presser plate;

(e) a clutch spring device braced in between the clutch cover and the presser plate;

(f) a rotationally elastic element in a drive path between the internal combustion engine and the flywheel to damp torsional vibrations of the drive path; and

(g) a controllable bridge-over clutch for the non-rotatable bridging over of the rotaionally elastic element at rotation rates in the region of or below an idling rotation rate of the internal combustion engine, the flywheel and a starter gear connectible non-rotatably with a crankshaft carry starter toothings arranged side by side and wherein the bridge-over clutch is formed by a starter motor pinion which in the starting of the internal combustion engine engages in common in both starter toothings, and couples them non-rotatably with one another, but otherwise is disengageable from at least one of the two starter toothings.

4,624,352

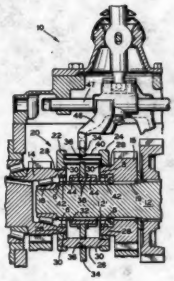
SYNCHRONIZER SPRING PIN

James A. Yarnell, Temperance, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 29, 1985, Ser. No. 759,810

Int. Cl.[4] F16D *23/06*

U.S. Cl. 192—53 E 6 Claims



1. In a double-acting synchronizer clutch including a spring means having a pair of radially aligned, opposed detents, two axially movable blocker rings having opposed apertures for receiving opposed ends of said spring means, an axially movable, radially extending flange having a plurality of circumferentially spaced openings, each disposed for receiving said opposed detents when said flange is positioned in a neutral mode between said blocker rings, said blocker rings being rigidly coupled together about a common rotational axis, said rings positioned in an axially spaced relationship on opposed sides of said flange; an improvement characterized by said spring means comprising a first leg extending axially and containing one of said detents, a second leg extending reversely with respect to said first leg, parallel to and spaced therefrom, said second leg containing the other of said detents, said spring means further comprising a third leg intermediately positioned between said first and second parallel legs, said third leg integrally connecting said first and second legs, said spring means formed of spring steel, and defining an elongated S-shaped body in its normally unstressed state.

4,624,353

FRICTION DEVICE

Hubert Sailer, Markdorf; Friedrich J. Ehrlinger, Friedrichshafen, and Josef Dietenberger, Aulendorf, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 5, 1984, Ser. No. 647,771

Claims priority, application PCT Int'l Appl., Sep. 5, 1983, PCT/EP83/00232

Int. Cl.[4] F16D *13/72*

U.S. Cl. 192—70.12 20 Claims

1. A friction device, comprising:

a housing;

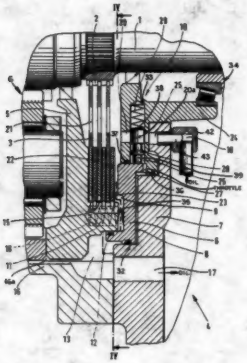
a rotatable shaft supported in said housing;

at least one friction disk connected to said shaft so as to be rotatable therewith, said friction disk being provided with at least one through-opening;

cooperating means accommodated in said housing and engageable with said friction disk;

control means associated with said housing and operatively connected with said cooperating means for providing a cooling effect of said friction disk, said control means including at least one valve formed in said housing at a fixed location with respect to said shaft regulating the flow of a fluid through a channel whose outlet is approximately axially juxtaposed with said through-opening, said

valve being constructed and arranged to open only upon actuation of said friction disk to supply said fluid thereto; and



discharge means for continuously removing fluid from said friction disk.

4,624,354

ELECTROMAGNETIC CLUTCH

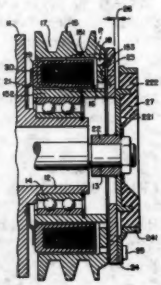
Takatoshi Koitabashi, Annaka, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Sep. 29, 1981, Ser. No. 306,660

Claims priority, application Japan, Nov. 10, 1980, 55-161093[U]; Dec. 27, 1980, 55-187841[U]

Int. Cl.[4] F16D *3/12, 3/76, 27/10, 27/14*

U.S. Cl. 192—84 C 18 Claims



1. In an electromagnetic clutch including a first rotatable member having an axial end plate of magnetic material, a second rotatable member to be connected to a driven member, an annular armature plate of magnetic material joined to the second rotatable member so as to be capable of limited axial movement, said annular armature plate facing said axial end plate of said first rotatable member with an axial air gap therebetween, and an electromagnetic means associated with said axial end plate for attracting said armature plate, whereby the rotation of said first rotatable member can be transmitted to said second rotatable member through said armature plate by the operation of said electromagnetic means, the improvement comprising a holder extending from said armature plate at its axial end surface opposite from its end surface which faces toward said axial end plate, said holder plate being formed with a first axially extending flange, said first axially extending flange having a configuration including at least one straight line, said second rotatable member being fixed on a hub having a radially extending flange portion, said radially extending flange portion having an inner and an outer axial end surface which extends radially between and connects said hub and a second axially extending flange portion, said inner axial end surface facing toward said axial end plate and said outer axial end surface facing away from said axial end plate, said first and second axially extending flange portions having similar configurations and facing one another with a radial gap between them, and an elastic member disposed in an inner peripheral surface of said first axial flange portion and extending therefrom to fill said radial gap between said first and second axially extending flange portions, to cover substantially the entire extent of said outer axial end surface located between said second axially extending flange portion and said hub and also to cover said second axially extending flange portion whereby the relative rotation between said first and second axially extending flanges is limited by the compression of said elastic member between the mating straight lines of said first and second axially extending flanges and the diffusion of vibration from the driven member is minimized.

4,624,355

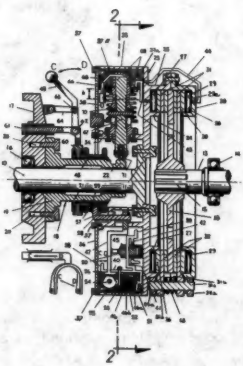
HYDRAULIC CLUTCH AND PUMP ASSEMBLY

Joseph Mroz, 2584 Montgomery Street, Montreal, Canada H2K 2S4

Continuation-in-part of Ser. No. 405,945, Aug. 6, 1982, abandoned. This application May 29, 1984, Ser. No. 614,549

Int. Cl.[4] F16D *25/04, 25/12*

U.S. Cl. 192—85 AA 5 Claims



1. A hydraulic clutch and pump assembly comprising an input shaft and an output shaft rotatably mounted in end-to-end co-axial relation and for independent rotation one relative to the other, at least one clutch disc connected to the output shaft and bodily rotatable therewith, at least one clutch shoe bodily rotatable with the input shaft and axially displaceable relative thereto between a cluching position in engagement with said one clutch disc and declutching position out of engagement with said one clutch disc, biasing means biasing said clutch shoe to declutching position, a hydraulic fluid pump connected to the input shaft and bodily rotatable therewith, a fixed body portion rotatably carrying the input shaft and including a pump actuation member, the hydraulic fluid pump including a pumping member operatively actuated by the pump actuation member in response to bodily rotation of the pump with the input shaft relative to the fixed body portion, a cylindrical hydraulic fluid reservoir co-axial with said input shaft, a ring connected to the input shaft and carrying the reservoir, the pump, and said one clutch shoe for bodily displacement thereof with the input shaft, each clutch shoe cooperatively forming with said ring an annular chamber, an elastic flexible annular bag in said annular chamber, said pump having an inlet communicating

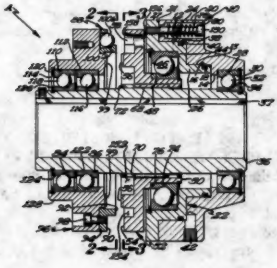
with said reservoir, a hydraulic fluid line connecting the outlet of said pump to said bag, a control valve series connected in said fluid line intermediate said bag and said pump, an actuator moving said control valve between a first position in which the outlet of said pump is connected to said bag to move said clutch shoe to clutching position, and a second position in which the outlet of said pump is disconnected from said bag and said bag is drained into said reservoir in said declutching position of said clutch shoe, and a pressure relief valve having an inlet connected to said fluid line, and outlet connected to said reservoir and a compression spring compressed by said actuator in the first position of said control valve and released by said actuator in the second position of said control valve, whereby the pumped fluid can be returned to the reservoir under minimum back pressure in the declutching position of said clutch shoe.

4,624,356

FLUID PRESSURE OPERATED, AXIALLY-ENGAGING CLUTCH

James V. Hanks, Robbinsdale, and Charles D. Raines, Blaine, both of Minn., assignors to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Mar. 25, 1985, Ser. No. 715,736
Int. Cl.[4] F16D *25/061*
U.S. Cl. 192—85 CA **21 Claims**



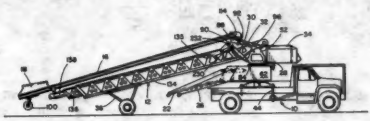
1. Clutch comprising, in combination: an input having a first interface surface; an output having a second interface surface; with at least the first interface surface being slidably mounted from a first interface position where the first and second interface surfaces are spaced by a distance and a second interface position where the first and second interface surfaces are rotatably engaged; means for moving the first interface surface between its first and second interface positions for selectively interrelating the input and output for allowing the input and the output to be rotatably related and for allowing the input and the output to be rotatably independent; with one of the input and the output including a multiplicity of projection-receiving cavities; with the other of the input and the output including a projection carrier ring having a multiplicity of projections for engagement with the cavities, with the cavities and projections arranged so that at least in a first registry position the projections overlie the cavities allowing the interface surfaces to rotatably relate the input with the output and when the projections and cavities are not in the first registry position the interface surfaces are prevented from rotatably relating the input with the output; wherein the projection carrier ring comprises, in combination: a flat, radially disposed ring portion terminating in its inner edge in a right angular annular inner flange; and projection receiving sockets for capturing the projections, with the right angular annular inner flange located radially inward of the projections tending to allow any dislodged projections to travel radially outward of the clutch and tending to prevent the dislodged projection from traveling radially inward of the clutch and between the interface surfaces of the clutch and jamming between the interface surfaces causing unwarranted engagement of the input and the output; and wherein the distance between the first and second interface surfaces in the first interface position is larger than the projections for aiding in preventing any dislodged projection from jamming between the first and second interface surfaces and causing unwarranted engagement of the input and the output of the clutch.

4,624,357

VEHICLE-MOUNTED EXTENSIBLE CONVEYOR

Robert F. Oury, Gilberts, and Charles J. Arndt, Elk Grove Village, both of Ill., assignors to Rotec Industries, Inc., Elmhurst, Ill.

Filed Jun. 25, 1984, Ser. No. 624,239
Int. Cl.[4] B65G *41/00*
U.S. Cl. 198—313 **6 Claims**



1. A self-propelled conveyor means for concrete and the like which can be compactly nested for highway travel, comprising, in combination:

a vehicle having a front and rear, said rear including two outermost power wheels, said power wheels defining a predetermined side-to-side width of said vehicle,

a turntable mounted on said vehicle,

an extensible boom for rotation on said truntable,

an extensible conveyor supported by said boom,

yoke means for pivotally mounting said extensible boom cantilever fashion on said turntable, said yoke extending above said turntable, so the boom may be elevated and rotated toward the rear of the vehicle when the vehicle is in transit,

a hydraulic cylinder disposed between said yoke and said boom to elevate and lower the boom,

removable pins for securing said cylinders to said yoke, whereby the cylinder may be disconnected so the free end of said boom may freely move up and down when the vehicle is in transit,

two pairs of outriggers mounted for rotation at their inner ends on vertically disposed arbors fixed to the vehicle beneath said turntable and outside the circumference of said turntable,

the first pair of said arbors disposed rearwardly of said turntable and symmetrically with respect to the forward-rearward centerline of said turntable, the second pair of said arbors disposed forwardly of said turntable radially outside said first pair and symmetrically with respect to the forward-rearward centerline of said turntable, said outriggers nesting rearwardly and defining a side-to-side width less than said predetermined side-to-side width of said vehicle,

wheel means for supporting the free end of the boom while the vehicle is in transit,

a pair of arms pivotally mounted on said yoke, said arms extending above said yoke, and

a feed conveyor having receiving and discharge ends, said discharge end pivotally secured to said arms,

whereby, during transit, said outriggers can be folded back, toward the rear of the vehicle, with one pair nested inside the other, said boom can be disposed over said folded outriggers with said wheel means on the ground, and said feed conveyor can be disposed over said boom, said outriggers, boom, and feed conveyor all substantially completely lying within said side-to-side width of said vehicle.

4,624,358
DEVICE FOR TRANSFERRING LEAD FRAME

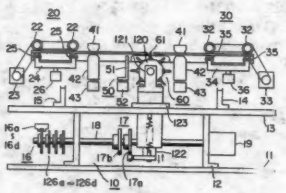
Takeo Satou, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 6, 1984, Ser. No. 586,696

Claims priority, application Japan, Mar. 7, 1983, 58-37163; Mar. 7, 1983, 58-37164

Int. Cl.⁴ B65G *25/04*

U.S. Cl. 198—345 **7 Claims**



1. A lead frame transfer device comprising:

first and second guide rails, said first guide rail being supported by a first stationary supporting plate, and said second guide rail being supported by a second supporting plate movable with respect to said first plate so as to vary a width between said guide rails; and

a lead frame transferring mechanism for transferring a lead frame along a transfer path, provided on said first guide rail, comprising:

(a) a lead frame feed device provided at a first end of the transferring path, comprising at least one feed roller for feeding the lead frame into said transferring path, and a drive means for driving said feed roller;

(b) a lead frame discharge device provided at a second end of said transferring path, comprising at least one discharge roller for discharging the lead frame from the transferring path, and a drive means for driving said discharger roller;

(c) an intermittent feed device provided along the transferring path between said lead frame feed device and said lead frame discharge device, comprising:

a chuck mechanism having at least one pair of stationary pawls and at least one pair of movable pawls for clamping therebetween a side edge of the lead frame transmitted from said lead frame feed device; and

a slide rod for supporting said pawls, and a driving mechanism operatively coupled to said slide rod for driving said chuck mechanism along the transferring path;

(d) a stopping device having a stopper means adapted to retractably engage a leading edge of a lead frame at a preselected position so as to stop the lead frame along the transferring path, and a means for retracting and engaging said stopper means; and

(e) a positioning device having a plurality of pins, each of said pins being adapted to engage with different types of lead frames.

4,624,359
FLEXIBLE DRIVE SYSTEM

Jack R. Gross, Waynesville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 20, 1984, Ser. No. 684,418

Int. Cl.⁴ B65G *47/46*

U.S. Cl. 198—366 **24 Claims**

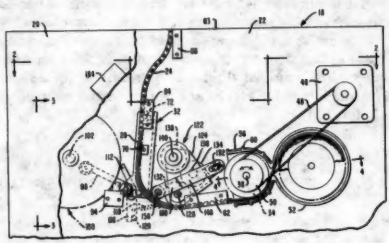
1. A drive system comprising, in combination:

frame means;

track means mounted on said frame means and including trunk means, a plurality of extended track means extending to a plurality of destinations, and switching means positioned between said trunk means and said extended track means, whereby said switching means may be operated to select a given one of said plurality of extended track means, to enable said utilizing means to be dispatched from said trunk means to a selected one of said plurality of destinations;

strip means adapted to be respectively movable in either of two directions along said track means, said strip means having first and second portions;

utilizing means coupled to said first portions of said strip means;



means coupled to said second portions of said strip means for selectively moving said strip means to move said utilizing means to any one of a plurality of different positions alongsaid track means; and

at least one mechanism operator on said frame means engageable with said utilizing means in at least one of the plurality of different positions along said track means to cause the performance of at least one preselected operation by said utilizing means.

4,624,360
PROCESS AND APPARATUS FOR SLIPPING TUBES ONTO PEGS OF A TRANSPORT BELT

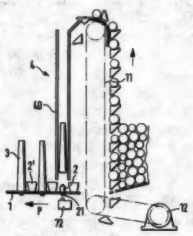
Johann Walk; Rainer Studtmann, and Fritz Haller, all of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jun. 18, 1982, Ser. No. 389,875

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3123997

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—398 **12 Claims**



1. A process for slipping tubes onto pegs of a transport belt on spinning machines or twisting machines, comprising the steps of:

slipping the tubes onto the pegs in an orderly fashion using a slipping-on apparatus;

monitoring during the slipping-on step the orderly slipping of the tubes onto the pegs and sensing a tube which has been incorrectly slipped on a peg;

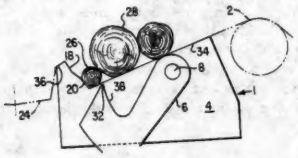
lifting off and pushing back into said slipping-on apparatus an incorrectly slipped-on tube; and

discarding said incorrectly slipped on lifted-off tube and repeating the slipping-on step by the slipping-on apparatus using a new tube for the affected peg.

4,624,361
SINGLE LOG FEEDER

Bryant C. Hollins, 100 Mile House, Canada, assignor to Exco Industries Ltd., British Columbia, Canada

Filed Jun. 12, 1984, Ser. No. 619,787
Claims priority, application Canada, Feb. 14, 1984, 447366
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—463.5 **11 Claims**



1. An apparatus for individually sorting and separating a plurality of cylindrical objects of the same or varying diameter and length comprising:

(a) inclined receiving means including an inclined receiving face which receives the cylindrical objects by having the cylindrical objects roll laterally onto the upper end of the inclined receiving face, the inclined receiving means having at its lower end a restraining means including a restraining face which extends at an angle to the receiving face and which holds the cylindrical objects in parallel and abutting relationship with one another at the lower end of the inclined receiving face and upwardly along the inclined receiving face; and

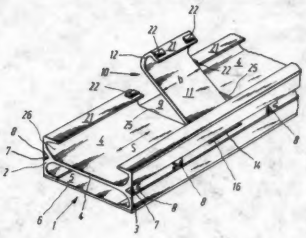
(b) cylindrical object separating and raising means associated with the inclined receiving means for separating and raising the foremost restraining means abutting cylindrical object from the secondarily disposed cylindrical objects on the inclined receiving face and dispensing the foremost cylindrical object from the apparatus in a direction away from the direction in which the cylindrical objects are received by the inclined receiving means, the separating and raising means including an arm pivoted at a location upstream relative to the restraining face to reciprocate upwardly and downwardly between a lower position and an upper position relative to the inclined receiving face, said arm including a lifting portion underlying the inclined receiving face when in a lower position, and being positioned at least in part above at least a portion of the inclined receiving face when in an upper position such that the lifting portion is engageable with the foremost object to lift it above the restraining face, said arm further including a separating portion adjacent an upstream end of said lifting portion and being engageable with a secondarily disposed cylindrical object to separate it from the foremost object as the latter is lifted by said lifting portion, said separating portion being movable upstream relative to said restraining face during upward movement of said arm.

4,624,362
CHANNEL SECTIONS FOR SCRAPER-CHAIN CONVEYORS

Helmut Temme, Waltrop; Gunther-Dietmar Schoop, Ottmarsbocholt, and Hartmut Schewinski, Kamen-Westick, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhytte Westfalia, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,719
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1984, 3405986
Int. Cl.[4] B65G *19/28*
U.S. Cl. 198—735 **11 Claims**

1. A channel section for a scraper-chain conveyor; said channel section comprising one-piece shaped side walls and a floor plate extending centrally therebetween, a generally L-shaped opening in the channel section which extends over a part of the floor plate and an upper part of one of the side walls above said part of the floor plate, said opening being closed by means of detachable insert means, said insert means comprising a first portion matching the part of the floor plate to preserve

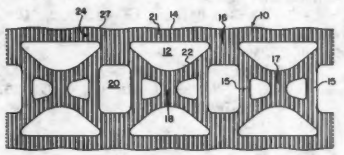


the continuity of said floor plate and a second portion matching the upper part of said one side wall to preserve the continuity of the upper region of the side wall and detachable securing means for securing the insert means in place, the securing means locating solely with said second portion of the insert means.

4,624,363
MULTI-PACKAGING DEVICES, METHODS AND MACHINES

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 23, 1985, Ser. No. 768,587
Int. Cl.[4] B65D *75/00, 71/00*
U.S. Cl. 206—150 **13 Claims**



1. A multiple container carrier device of thermoplastic material for an array of a plurality of containers having a given peripheral dimension, the carrier device including a plurality of apertures formed by interconnected bands, said apertures being elongated in the length direction of said device and having an unstressed peripheral dimension substantially less than said given peripheral dimension, a plurality of transversely directed corrugated sections formed in said device, the corrugated sections are an alternating series of relatively thick and relatively thin cross-sectional thickness on at least portions of the length of the bands of the device, wherein the device may be elongated by tensioning and said aperture peripheral dimensions thereby enlarged to be associated with the containers to be multi-packaged.

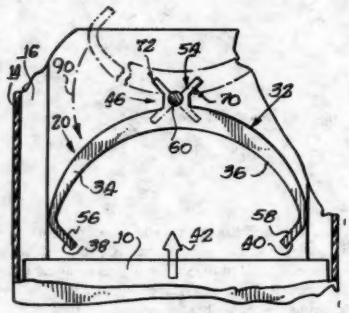
4,624,364
STOP DEVICE

Henry Swain, Basking Ridge, N.J., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 6, 1985, Ser. No. 730,516
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 **13 Claims**

1. A stop device for electronic components housed within a tube, comprising: an elongate resilient member defining abutment surfaces thereon for exerting a positive pressure on said

electronic components and for absorbing additional pressure applied to said components during handling, said elongate member being bow-shaped and defining a pair of legs extending outwardly from an apex, and mounting means for pivotally



mounting said stop device, same mounting means comprises elongate pin means dimensioned for traversing one interior dimension of said tube and pin-engaging means on said elongate member for pivotally engaging said pin means.

4,624,365

PACKAGING ARRANGEMENT FOR PLASTIC BAGS

Flávio Derdyk, Sao Paulo, Brazil, assignor to Plasticos Polyfilm S/A, Sao Paulo, Brazil

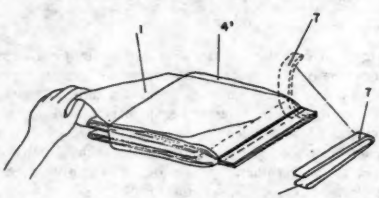
PCT No. PCT/BR83/00011, § 371 Date Jan. 22, 1985, § 102(e) Date Jan. 22, 1985, PCT Pub. No. WO85/00793, PCT Pub. Date Feb. 28, 1985

PCT Filed Nov. 11, 1983, Ser. No. 717,242

Claims priority, application Brazil, Aug. 3, 1983, 8304169

Int. Cl.[4] B65D *85/62*

U.S. Cl. 206—554 **4 Claims**



1. A package comprising:

a stack of open-mouth generally flat bags of sheet material having transverse tear-strips at their mouths and with said mouths being aligned, said stack being folded once longitudinally, i.e. at a transverse folding line, with said tear-strips extending beyond the bottoms of said bags, and folded once tranversely, i.e. at a longitudinal folding line, so that the side edges of said bags are substantially aligned;

an open-mouth generally flat packaging bag of sheet material enclosing said stack with said tear strips at the bottom of said packaging bag;

means fastening together said tear strips and the adjacent portions of the side walls of said packaging bag; and

openable means closing the mouth of said packaging bag,

whereby on opening the mouth of said packaging bag, the bags therein can be removed one-by-one by detaching the outermost bag of the folded stack from its corresponding tear-strip.

4,624,366

CONTAINER

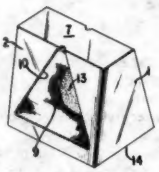
Herman L. Marder, Somerville, and Ernest E. Lindlar, Old Bridge, both of N.J., assignors to Church & Dwight Co., Inc., Piscataway, N.J.

Continuation-in-part of Ser. No. 94,194, Nov. 14, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 300,253

Int. Cl.[4] A24F *25/00*

U.S. Cl. 206—620 **11 Claims**

1. A carton containing powdered material capable of absorbing odors in a confined area comprising a top portion, a bottom portion and at least four side portions, with at least two of the opposing side portions having at least one opening therein covered with a sufficiently porous liner to allow free passage of air therethrough while keeping the powdered material in the container and means for sealing said openings until the container is ready for use by exposing material in the container to the atmosphere, the said liner being capable of holding particles with a particle size of 10 microns or larger and having a porosity capable of allowing air passage at a rate of 200 to 1000 ft.^{3}/min./ft.^{2}.



4,624,367

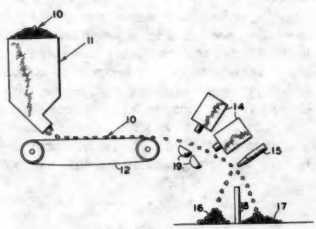
METHOD AND APPARATUS FOR DETERMINING CONFORMITY OF A PREDETERMINED SHAPE RELATED CHARACTERISTICS OF AN OBJECT OR STREAM OF OBJECTS BY SHAPE ANALYSIS

John L. Shafer, 15602 Winmoss Ct., Houston, Tex. 77210, and Robert Ehrlich, 2510 Stratford Rd., Columbia, S.C. 29204

Filed Apr. 20, 1984, Ser. No. 602,533

Int. Cl.[4] B07C *5/00*

U.S. Cl. 209—577 **8 Claims**



1. A method for determining a characteristic or property of randomly oriented irregularly shaped objects comprising:

obtaining an image of the profile of each of said objects;

selecting a plurality of edge points from said profile;

deriving a Fourier series in polar form from said selected edge points whereby a plurality of Fourier amplitudes for each profile is obtained;

orthogonalizing said amplitudes to obtain orthogonalized data; and

comparing the orthogonalized data with a pre-established criteria.

4,624,368
COLOR SORTING APPARATUS FOR GRANULAR OBJECTS

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,212
Claims priority, application Japan, Mar. 26, 1983, 58-50773
Int. Cl.[4] B07C 5/342
U.S. Cl. 209—581 **4 Claims**

1. A colour sorting apparatus for granular objects comprising a plurality of colour sorting units, each unit having:

means for feeding the granular objects to a sorting path;

collecting means for collecting acceptable objects;

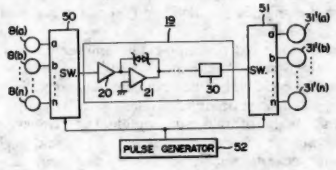
discharging means for discharging unacceptable objects;

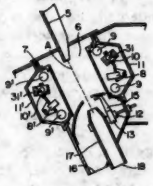
ejecting means for blowing aside the unacceptable objects to said discharging means;

detecting means disposed at opposite sides along said sorting path each including light emitting means to send light to said sorting path, background light means to provide a reference amount of light, and light receiving means for receiving light coming from the objects in said sorting path and from said background light means; and

valve actuating means connected to said ejecting means and responsive to said light receiving means for producing an ejection signal when there comes any unacceptable object in said sorting path, said colour sorting apparatus further comprising:

a continuous adjusting means connected between said light receiving means and said background light means for producing a correction signal which indicates the necessary amount and direction of correction to be effected as to the amount of light emitted from said background light means based on the amplitude and the polarity of the





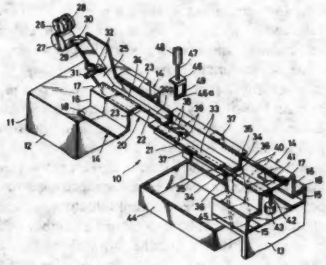
output of said light receiving means with respect to a predetermined level, and for automatically adjusting the amount of light emitted from said background light means in accordance with said correction signal, so that there is substantially no difference between the amount of light received by said light receiving means in the case where no objects exist in said sorting path and the amount of light received by said light receiving means in the case where only acceptable objects exist even when the colour tone of the acceptable objects is varied during sorting operation; and

a scanner circuit means connected to said adjusting means for effecting sidewise switching-over operation among said plurality of colour sorting units in such a manner that said adjusting means is commonly provided for all of said colour sorting units and is connected successively to each of said light receiving means and said background light means of the corresponding colour sorting unit for a predetermined period of time which is sufficient to fully correct the amount of light emitted from each of said background light means.

4,624,369
METHOD OF AND APPARATUS FOR SORTING SLIDE FASTENERS

Yozo Okada, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,750
Claims priority, application Japan, Aug. 15, 1983, 58-149073
Int. Cl.[4] B07C 5/00
U.S. Cl. 209—626 **11 Claims**



1. A method for sorting good flexible slide fasteners with sliders mounted thereon from defective slide fasteners without sliders, comprising the steps of:

(a) feeding the flexible slide fasteners longitudinally one at a time along a path by at least one stream of air flowing along the path, while simultaneously supporting each moving flexible slide fastener along both the length and width thereof;

(b) introducing the slide fastener while being fed, into a gate which is narrow enough to prevent the passage of sliders so that a good slide fastener having a slider is stopped at the gate, while a defective slide fastener without a slider continues to be driven in the same direction by the air-stream to pass through the gate; and

(c) interrupting said at least one stream of air while removing said support to thereby enable the good slide fastener which has been stopped at the gate to fall by gravity from the path.

4,624,370
VIBRATORY SEPARATION APPARATUS

Gary A. Danner, and Raymond W. Sherman, both of Barrington, Ill., assignors to General Kinematics Corporation, Barrington, Ill.

Filed Mar. 14, 1984, Ser. No. 589,651
Int. Cl.[4] B07B 7/00; B07C 5/38
U.S. Cl. 209—631 **12 Claims**

1. An improved vibratory separating apparatus of the type having a conveying surface for moving a composite mixture in a conveying direction between an inlet end and a discharge end

and having a first conveying plateau and a second conveying plateau spaced from the first plateau toward the discharge end and a drop-out opening between the first and second plateaus, said first plateau directing the composite mixture substantially along a plane adjacent the drop-out opening and having an edge at the drop-out opening, said second plateau having a landing area including at least a portion spaced beneath the edge of the first plateau, the landing area including a planar surface and an edge bounding the drop-out opening, and means for vibrating said conveying surface to effect vibrating movement of the composite mixture, the improvement comprising:

means for directing air from a pressurized air source angularly with respect to the plane of direction of particles on the first plateau so as to enhance breakup of the composite material and cause materials of a predetermined size and density over the drop-out opening to be propelled to the landing area on the second plateau for conveyance to a first area,

whereby materials of a size and density other than those of said predetermined size and density pass through the drop-out opening for separate collection;

means for translating at least a portion of the landing area selectively in the conveying direction to enlarge the drop-out opening and oppositely to the conveying direction to diminish the area of the drop-out opening;

means to adjust the angular position of the planar landing area and to thereby adjust the relative vertical position of the edge of the second plateau and the first plateau to permit selective control of the nature of the material reaching the second plateau; and a pressurized air source, said source of pressurized air comprising a pressure chamber and blower means communicating with a converging chamber through said pressure chamber, said directing means comprising a duct having walls defining a flow path that is angled with respect to the plane of direction of particles on the first plateau and communicating between the converging chamber and the drop-out-opening.

4,624,371

SECURITY CLOTHES-STAND

Bernd Korth, Weil am Rhein, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands

Filed Oct. 11, 1984, Ser. No. 659,642

Claims priority, application Switzerland, Oct. 27, 1983, 5825/83

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—4 **5 Claims**

1. A safety garment stand for presenting articles of clothing in sales rooms and show rooms, comprising a mumber of holding rods (4) made of a jacket tube (11) which are rotatably mounted on a supporting device (1–3), the lower end of the jacket tube being rotatably mounted on a base tube (10) which is firmly connected to the supporting device, and a lock attachment (14) for releasably receiving clothes hangers (7), which are lockable thereon, being provided at the upper end of the jacket tube, said lock attachment (14) including a housing block (16, 16') comprising a central receiving orifice (24) for receiving a holding member (7.5) of said clothes hanger (7) and a releasable snap-in catch (15) for retaining said holding member (7.5) by means of a locking tongue (27) which is lockable from the outside with a key (21).

4,624,372

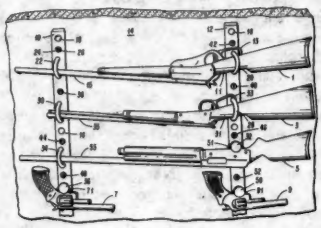
GUN SECURITY APPARATUS

Charles A. Brolin, 1100 30th St. SE, Cedar Rapids, Iowa 52403

Filed Jan. 3, 1984, Ser. No. 567,841

Int. Cl.[4] A47F *5/08*

U.S. Cl. 211—4 **40 Claims**



1. Apparatus to secure guns, the invention comprising

a base,

an elongated pin engageable to said base,

a locking member engageable with said pin,

said base having a front face and a rear face,

said base being permanently attachable to a substantially immovable structure at its rear face,

said front face having an elongated opening therewithin,

said elongated opening having an axis substantially non-parallel to the front face of said base,

said elongated pin having a first end, a central body and a second end,

said elongated pin capturingly embracing said gun along the first end and central body of said pin,

said second end of said pin being insertable into said elongated opening of said base,

said body of said pin containing a transverse groove thereon adjacent the second end of said pin

said locking member selectively engaging said transverse groove of said elongated pin,

said locking member lockably positioned in engagement with said transverse groove of said pin

said base having a recess within the rear face thereof,

said base having an indentation within the recess of said rear face,

said elongated opening communicating with said recess outside said indentation in said recess,

said locking member housed within said indentation.

4,624,373

STORING RACK FOR CORE SAMPLE BOXES

John D. Caron, 9 Birch Bay, Winnipeg, Manitoba, Canada R2J 2B7

Filed May 10, 1984, Ser. No. 608,947

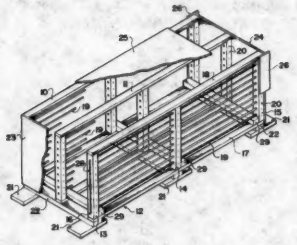
Claims priority, application Canada, May 19, 1983, 428483

Int. Cl.[4] A47G *19/08*

U.S. Cl. 211—41 **14 Claims**

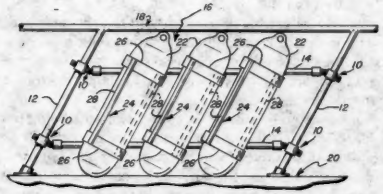
1. A rack for storing elongate core sample boxes comprising a plurality of rectangular support frames, each frame being formed as a separate transportable unit and including a plurality of spaced parallel timber uprights, a pair of cross members each extending along a full length of the frame such that one of the pair is connected to each upright at an upper end thereof and the other of the pair is connected to each upright at a lower end thereof, each of the uprights having therethrough a plurality of bores spaced along the length of the upright, each bore extending through the upright parallel to the cross members, and a plurality of rack support members each formed from tubular metal and extending the full length of the frame parallel to the cross members and to each other and each

extending into a respective bore in each of the uprights, means for coupling each support member to an upright at a portion of the support member extending into the bore of the upright such that the support members are supported by the uprights in



parallel spaced relation, and a plurality of planar support members for forming end and top panels for interconnecting the frames in spaced parallel relation whereby the core sample boxes can rest across the rack support members.

4,624,374
UNIVERSAL CONNECTOR
John J. Murtaugh, Streator, Ill., assignor to Med Marine International Inc., Peru, Ill.
Filed Sep. 20, 1984, Ser. No. 652,866
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—60.1 **16 Claims**



1. A connector for securing a pair of elongated elements in adjustable angular reglation comprising:

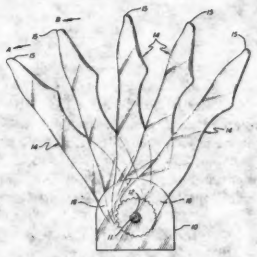
a pair of cooperative clamping members adapted to be clamped in place on one of said elongated elements, each of said clamping members having a clamping portion intermediate its ends adapted to clampingly engage a surface on one side of said one elongated element and having first and second opposite end portions extending outwardly of said intermediate portion;

a third member adapted to be secured to the other of said pair of elongated elements;

said first end portions including hinge means for pivotally and releasably interconnecting said clamping members for permitting said intermediate clamping portions to move toward and away from each other while pivoting about an axis generally parallel of said one elongated elements between a clamping position engaged against said one elongated element and an open position wherein said one elongated element is positioned directly between said second end portions of said clamping member as said connector is moved into a ready position with said one elongaged element directly between said intermediate clamping portions in preparation for clamping engagement thereby, said hinge means of each clamping member including a hinge element and an adjacent open recess adapted to receive the hinge element of the other clamping member seated therein for pivotal movement between said hinge elements while seated in said recesses as said intermediate clamping portions are moved toward and away from each other, at least one of said first end portions including pivot means for pivotally supporting said third member to permit angular adjustment between said pair of elongated elements when said members are clamped and secured thereto; and

means for interconnecting said second end portions of said clamping members to move said clamping portions thereof into said clamping position on said one elongated element.

4,624,375
STOCKING DISPLAY DEVICE
John M. Strongosky, McGraw, and David M. Freund, Syracuse, both of N.Y., assignors to RPM Industries, Inc., Auburn, N.Y.
Filed Jan. 7, 1985, Ser. No. 689,462
Int. Cl.[4] A47F *5/12*
U.S. Cl. 211—170 **6 Claims**

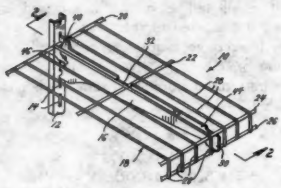


1. An adjustable stocking display device comprising a plurality of stocking forms mounted on a common support such that each said form can be selectively moved into any of a number of different angular positions and said forms locked in such positions, said stocking forms having a generally leg-shaped profile with a toe end and a thigh end, said thigh end including means for mounting said stocking form on said support, said support including a common shaft passing through said common support and through the mounting means of each said stocking form; support means for supporting said shaft; a plurality of apertured disc-like positioning members each being disposed on said shaft against a respective one of said stocking forms, the disc-like positioning members and the stocking forms having mutually coacting interengaging structue to engage each other in non-rotational engagement; means on said shaft engaging corresponding means on said positioning members for preventing rotation of the latter on said shaft but permitting sliding of the positioning member relative thereto and permitting rotation of said stocking forms; and means on said shaft for releasably engaging said stocking forms, in their selected positions, against said positioning members.

4,624,376
ADJUSTABLE WIRE SHELF AND BRACKET
Paul F. Bertram, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Dec. 15, 1983, Ser. No. 561,895
Int. Cl.[4] A47F *43/00*
U.S. Cl. 211—187 **10 Claims**

1. In a shelf assembly of the type having a generally vertical support, a unitary cantilever support and a wire shelf mounted thereon the wire shelf having a first edge, the cantilever support having a first end and a second end remote therefrom, means joining the first end to the generally vertical support with the second end spaced therefrom, the improvement comprising means interengageable between the wire shelf and the second end of the cantilever support preventing upward dis-

placement of the wire shelf when mounted in the assembly and wherein the cantilever support has means trapping the first



edge of the wire shelf between the cantilever support and the vertical support and preventing displacement of the shelf.

4,624,377

CHILD RESISTANT CLOSURE

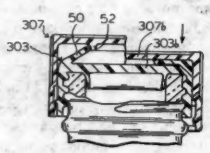
Victor Wassilieff, Paris, France, assignor to Zeller Plastik, Koehn, Grabner & Co., Zell/Mosel, Fed. Rep. of Germany

Division of Ser. No. 604,138, Apr. 26, 1984, abandoned. This application Nov. 13, 1985, Ser. No. 797,762

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315548

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—220 **6 Claims**



1. A child resistant closure for a container having a neck opening that may be withdrawn from the container by applying an axial force and a simultaneous rotational movement comprising in combination:

a. an inner cap adapted to fit the orifice and couple with the container neck, the inner cap having a circumferentially extending skirt and an inner cover plate;

b. an outer cap extending around the skirt of the inner cap and having an outer cover plate;

c. a clutch effective between said two caps, whereby said clutch engages by means of an axial movement directed against the outer cap by exerting an axial force thereon, so that a rotational torque exerted on the outer cap is transferable to the inner cap;

d. the clutch being provided with two axial symmetrical clutch elements, at least one element being an elastically deformable clutch element and being ineffective in its rest position and deformable during axial movement of the outer cap in such a way that a sufficient friction interlock is generated between said two caps, said one of the clutch elements comprising a wall in the form of a hollow frustum having an open end connected with one of the cover plates in such a manner that the other open end of said wall is directed toward the other cover plate and the other cap having annular shaped projections proximal to the open end of the wall in the rest position and is adapted to engage therewith to cause the friction interlock.

4,624,378

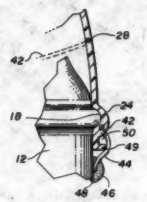
TAMPER INDICATING COVER

Nina P. Sawicki, 8347 Ranchito Ave., Panorama City, Calif. 91402

Continuation-in-part of Ser. No. 467,103, Feb. 16, 1983, Pat. No. 4,534,478. This application May 20, 1985, Ser. No. 736,176

Int. Cl.[4] B65D *41/46*

U.S. Cl. 215—230 **20 Claims**



1. A tamper indicating cover for a container having a neck, a shoulder at a spaced location below the neck, and a generally cylindrical body adjacent to and extending from the shoulder away from the neck, the cylindrical body having a region adjacent the shoulder which is groove free, the container closed by a cap and having an annular protrusion extending radially outwardly from the groove free region of the body adjacent to the shoulder, the cover comprising:

a tearable shroud portion positioned over the cap in access preventing relationship thereto and having an annular junction region;

an annular safety band integral with the shroud portion and extending from the annular junction region of the shroud, the band extending over the annular protrusion of the body for sealing the cover to the container thereby enclosing the cap; and

a pull tab extending from the safety band for being pulled to tear the safety band relative to the shroud to effect removal of the cover from the container and removal of the safety band from the annular protrusion to expose the annular protrusion to observation and give access to the container cap.

4,624,379

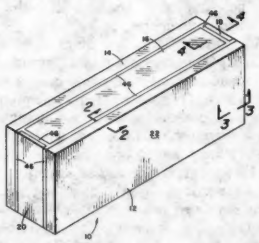
LETHAL SERVICE HEADER BOX

Robert K. Rothenbucher, Claremore, Okla., assignor to Smithco Engineering, Tulsa, Okla.

Filed Feb. 4, 1985, Ser. No. 698,185

Int. Cl.[4] B65D *6/32*

U.S. Cl. 220—4 R **2 Claims**



1. A lethal service header box for use in manufacturing an air cooled heat exchanger, comprising:

a vertical front plate, a vertical back plate, a horizontal top plate, a horizontal bottom plate, a vertical left end plate and a vertical right end plate;

the front plate having a vertical planar front surface and a generally planar vertical rear surface having a groove around the periphery thereof, the groove being spaced from the plate edge, the edges of the plate being beveled around the full periphery thereof providing a narrow width welding ledge between the bevel and the groove, the welding ledge being in the plane of the rear surface;

the right end plate having an outer planar surface, and an inner surface which is defined by a central planar surface and an integral raised portion of increased plate thickness along and spaced from the top and bottom edges of the plate, and the top and bottom integral raised portions being beveled to provide a top and bottom welding ledge, the thickness of the right end plate being greatest at the welding ledge;

a top plate having a planar top surface and a planar bottom surface;

the back plate being configured as the obverse of the front plate, the left end plate being configured as the obverse of the right end plate, and the bottom plate being configured as the obverse of the top plate;

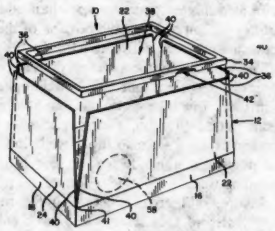
the plates being positioned in juxtaposed relationship to form a closed box and welded at the full peripheral edge of each plate, each weld being accomplished from outside the formed box and within a wedge shaped cross-sectional environment, the inner terminus of each weld cross-section being at a said narrow welding ledge of at least one of said plates.

4,624,380

DISPOSABLE LITTER ENCLOSURE

H. George Wernette, P.O. Box 219, Blue River, Oreg. 97413

Filed Dec. 5, 1985, Ser. No. 804,912
Int. Cl.[4] B65D *5/46*
U.S. Cl. 220—6 **2 Claims**



1. A disposable litter enclosure, as for cats, comprising:

(a) a box having, when assembled:

(1) a horizontal rectangular base;

(2) two pairs of opposite vertical sides, each extending upward from an edge of the horizontal rectangular base and joined together as a box, and each vertical side having a horizontal top edge;

(3) two pairs of opposite side extensions, each having a top edge, a bottom edge, and two side edges, the bottom edges continuing directly from the horizontal top edges of the vertical sides and extending an equal distance to their top edge; the side extensions foldable inward from the vertical sides to form a horizontal top to the box when said box is closed; and

(4) said side extensions tapering, at both side edges, from their bottom edges inwardly to their top edges, so that when the box is open with the side extensions upwardly unfolded and the tapered side edges abutted, the top edges of the two (2) pairs of opposite side extensions will form a horizontal rectangular perimeter of less dimension than, and centered above, the said rectangular base of the box; and

(b) a pre-formed, continuous, encircling framework, dimensioned to fit within and be contained by the said box when closed, which framework includes a continuous vertical slot for engagement of the said rectangular perimeter of side extension top edges, the length, width and depth of the slot being dimensioned so that it fits closely over the top edges of the side extensions when in rectangular perimeter form so as to maintain them in said tapered side-edge abutment;

said framework comprising an inside downward extending flange, an outside downward extending flange, and a continuous connecting top joining the said inside and outside flanges so as to present a continuous slot of inverted "U"-shaped cross section;

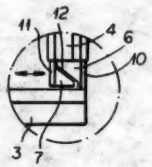
said framework providing continuous rigidity and structural integrity between the individual side extensions.

4,624,381

COLLAPSIBLE CONTAINER OR CARRYING CASE

Uwe W. Friedrich, Liebigstrasse, 4444 Bad Bentheim 1, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,796
Int. Cl.[4] B65D *6/26, 55/02*
U.S. Cl. 220—7 **7 Claims**



1. A collapsible container, comprising:

a rectangular base plate having a pair of opposite short sides and a pair of opposite long sides;

a respective generally rectangular side wall hinged to said base plate along each of said long sides and adapted to be folded from erect positions inwardly to overlie said base plate;

a respective generally rectangular end wall hinged to said base plate along each of said short sides at locations above that at which said side walls are hinged to said base plate and adapted to be folded from erect positions inwardly to overlie said side walls, each of said end walls being provided along opposite edges which are vertical in said erect positions of said end walls with a triangular cross section ridge having a free edge turned inwardly and defined by a first flank parallel to the plane of the respective end wall, a second flank at a right angle to said first flank, and a third flank inclined at an acute angle toward said first and second flanks, each of said side walls being provided along opposite edges which are vertical in said erect positions of said side walls with a triangular cross section ridge having a free edge turned outwardly and defined by a first flank parallel to the plane of the respective side wall, a second flank at a right angle to said first flank, and a third flank inclined at an acute angle toward said first and second flanks, said third flanks of adjoining ridges of each end wall and an adjacent side wall at each vertical edge of said container being in abutting and engaging contact to hold said walls erect; and

a pair of cover plates of rectangular configuration, each of said cover plates being hinged to an upper edge of a respective one of said end walls and being formed along opposite sides of the cover plate perpendicular to the respective upper edge with a downwardly extending lip, each of said side walls being formed along an upper edge thereof with a respective groove, each of said grooves

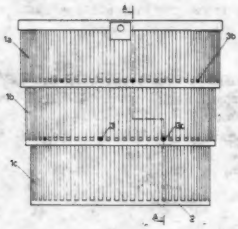
receiving the lips of both said cover plate along the respective side of the container.

4,624,382

MULTI-PURPOSE CONTAINER WHICH MAY BE REDUCED IN HEIGHT

Sergio Tontarelli, Via Mordini Ciriaco, 37, Castelfidardo (AN), Italy

Filed Feb. 10, 1984, Ser. No. 578,913
Claims priority, application Italy, Feb. 11, 1983, 511/83[U]
Int. Cl.[4] B65D *7/24*
U.S. Cl. 220—8 **5 Claims**



1. Multi-purpose container which may be reduced in height characterized by three cylindrical sections of successively diminishing diameter which means that they can fit onto one another like a telescope,

characterized by the fact that each cylindrical section moulded in one piece of plastic, has a top perimetral band which is connected to its lower edge by a plurality of thin, vertical parallel strips; the gap between each strip being equal to the width of the strip itself, further

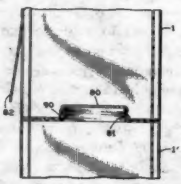
characterized by the fact that at regular intervals along the edge of the middle and bottom sections there are small protruding teeth which fit and slide respectively inside the vertical grooves found in the walls of the top section and middle section.

4,624,383

ENVIRONMENTAL BUILDING BLOCK CONTAINER SYSTEM

Roger F. Moore, 1151 S. Federal Hwy., Lot #19, Pompano Beach, Fla. 33062

Filed Oct. 17, 1985, Ser. No. 788,622
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—23.4 **3 Claims**



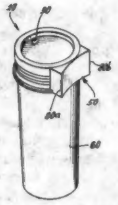
1. A container system comprising a plurality of symmetrical containers wherein each container is a polygon having at least one side consisting of a tongue and at least one side consisting of a groove symmetrically identical to said tongue, and wherein each container has a top and bottom consisting of interlocking means to the tops and bottoms of said symmetrical containers, whereby said tongue and groove and top and bottom interlocking means function to enable the construction of structures consisting of said interlocked containers, said top and bottom interlocking means further comprising a threaded neck with closing cap atop said container and a punch out or cut-out hole on the bottom of said container whereby said hole is substantially the same diameter of said threaded neck, whereby said threaded neck and cap may be interlockingly screwed into said hole of an adjacent container.

4,624,384

LID FOR DRINKING CONTAINERS

Duk H. Ko, 12354 Runnymede, Ste. #2, N. Hollywood, Calif. 91605

Filed Jul. 3, 1985, Ser. No. 751,440
Int. Cl.[4] B65D *41/26, 51/24*
U.S. Cl. 220—212 **2 Claims**



1. An improved resilient end closure having a generally circular cross-section for securing to the top of a beverage container having a generally cylindrical side wall, said resilient end closure comprising:

an elongated stepped skirt portion about the circumference of said end closure for insuring mating of said end closure with an upper portion of the beverage container;

stabilizer means disposed on a peripheral portion of said stepped skirt of said end closure to limit rotational movement of said beverage container when said container is in a resting position resting on a portion of the side wall with the end closure secured to the top of the container; said stabilizer means having a radially facing and axially extending outer surface bordered at each side thereof by a side surface, the intersection of said outer surface with said side surface defining foot portions on which the container and closure are also supported along with the associated portion of the side wall in said resting position;

a groove disposed on the underside of the periphery of said end closure, said groove being configured to provide a snap fit with and detachably secure said end closure to the upper portion of the beverage container; and

a fluid passageway disposed on a peripheral portion of said end closure adjacent the circumferential edge of said end closure radially inwardly of said groove substantially diametrically opposite the peripheral portion of said end closure comprising said stabilizer means.

4,624,385

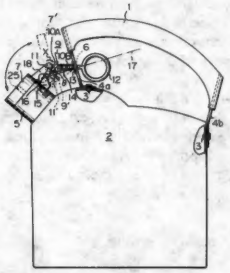
ACTUATING DEVICE FOR THE CAP OF A SPOUT OF A WHISTLING KETTLE

Hiroshi Yano, Tokyo, Japan, assignor to Hokusei Nikkei Household Utensils Co., Ltd., Toyama, Japan

Filed Dec. 12, 1985, Ser. No. 808,258
Int. Cl.[4] B65D *43/26*
U.S. Cl. 220—264 **6 Claims**

1. An actuating device for opening and closing a whistling cap of a whistling kettle, wherein the whistling cap is rotatably mounted on the spout by means of a first pivot, comprising an actuating rod which is rotatably mounted on the whistling cap by means of a second pivot, and means for continuously biasing the cap into a closed position, said actuating rod having a longitudinal axis which extends in a direction at an obtuse angle θ with respect to a line connecting the first and second pivots in the closed position of the whistling cap, said actuating

rod being capable of moving into a locked position past a dead point at which the longitudinal axis of the rod and the first and



second pivots are aligned on a same line when the rod is moved to open the whistling cap.

4,624,386

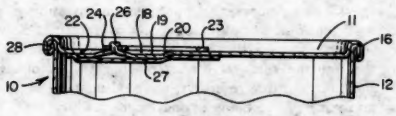
EASY OPENING CAN TOP

Donald C. Grigorenko, 8625 Dunblane Ct., Dublin, Ohio 43017, and Gerald C. Gardner, 305 Heathcote Rd., Hendersonville, N.C. 28739

Filed Nov. 18, 1985, Ser. No. 798,813

Int. Cl.[4] B65D *41/32*

U.S. Cl. 220—269 **2 Claims**



1. A can top comprising a generally circular body of thin, sheet steel having outer and under sides and an included opening underlaid by a correspondingly shaped, integral tongue lanced from said body except along a single, transverse bend line, said tongue having a marginal edge at least a portion of which is disposed beneath an edge of said body defining said opening whereby to impede accidental bending movement of said tongue upwardly through said opening; a film of rupturable synthetic resin adhesively secured to the under side of said body in covering relation to said tongue and opening; and a pull tab connected with said tongue and extending above the outer side of said body and providing a manually operable means for bending said tongue along said bend line and upwardly through said opening.

4,624,387

EASY-TO-OPEN LID OF A CONTAINER

Hiroshi Fujimoto, Tokyo, Japan, assignor to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,640

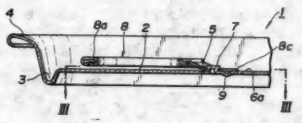
Claims priority, application Japan, Mar. 29, 1984, 59-44125[U]

Int. Cl.[4] B65D *17/34, 17/35, 17/36*

U.S. Cl. 220—273 **8 Claims**

1. In an easy-to-open container lid comprising a lid panel provided with a score line defining a severable area, said severable area having a rivet integral therewith, a pull tab anchored by said rivet to said severable area, wherein said pull tab has a first end adapted to be pulled by a finger and a second opposite contact end for contacting said severable area when said pull tab is pulled, with said second opposite contact end defining a line of contact on said severable area when said pull tab is pulled, the improvement comprising:

stiffening means formed in said severable area and located solely between said rivet and said line of contact defined by said second opposite contact end, said stiffening means



being located apart from said line of contact defined by said second opposite contact end.

4,624,388

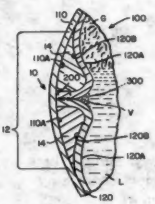
LIQUID TANK WELD CAVITATION PROTECTION

Yi M. Chang, Woodland Hills, and James R. Fenwick, Chatsworth, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 543,592, Oct. 19, 1983, Pat. No. 4,513,906. This application Feb. 11, 1985, Ser. No. 700,368

Int. Cl.[4] F16L *55/04*

U.S. Cl. 220—435 **12 Claims**



1. In a metal bladder tank having an outer rigid walled tank and a thin metal bladder disposed within said outer rigid walled tank, wherein said thin metal bladder is made up of a pair of sections having an edge weld securing said sections together, and the configuration of the interior surface of said thin metal bladder at said edge weld is in the structural form of a cavity which is horn-like in shape, the improvement therein being in the form of means for protecting said edge weld of said thin metal bladder against a cavitation-induced collapse when said thin metal bladder is partially filled with a pressurized liquid in motion, said protecting means comprising a backing made of a hard and ductile material situated adjacent said edge weld of said thin metal bladder and interposed between the exterior surface of said thin metal bladder and the interior surface of said outer rigid walled tank.

4,624,389

METHOD OF PERSONAL SELF-DEFENSE

Khoen P. Ang, 6541 Edwood, Cincinnati, Ohio 45224

Filed Jan. 22, 1981, Ser. No. 227,387

Int. Cl.[4] B05B *11/04*

U.S. Cl. 222—1 **10 Claims**

1. A method of personal self-defense against a human assailant comprising spraying in the direction of the assailant's face an aerosol stream of finely divided droplets of a non-toxic liquid substance capable of disabling the assailant by causing immediate tearing and stinging of the eyes without permanent harmful effect for a period of time sufficient to permit the victim to escape when the substance comes into contact with the eyes or the area immediately surrounding the eyes, wherein said substance comprises a thymol derivative selected from the

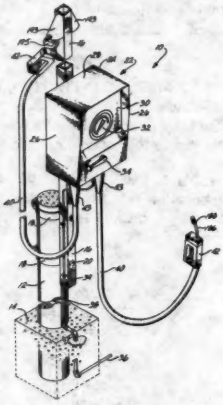
class consisting of peppermint oil, mint oil, peppermint camphor, and menthol.

4,624,390

NATURAL GAS FUELING SYSTEM

Stephen W. Palmer, El Monte, and Donald R. Gneiding, Fullerton, both of Calif., assignors to Dual Fuel Systems, Inc., Montebello, Calif.

Filed Mar. 29, 1984, Ser. No. 594,847
Int. Cl.[4] B67D 5/06, 5/32
U.S. Cl. 222—3 1 Claim



1. A gas refueling system for filling a pressurized tank from a pressurized gas supply comprising:

an upstanding support stanchion;

a dispensing assembly supported by the stanchion, the dispensing assembly including a valve having an inlet connected to the gas supply and two outlets, each including a male coupling;

a pair of hoses each having a first end adapted to connect to the tank for filling and an other end having a female coupling adapted to releasably connect to one of the male couplings such that opening of the valve delivers gas from the supply through the dispensing assembly and hose assembly to a tank;

a vent disposed along the stanchion, the vent including a pair of support plates each adapted to hold one first end of said hoses, the vent also including a pair of hoods to collect gas released from the first ends, each support plate having a groove to receive one first end; and

means for locking the first ends to the support plates including padlocks adapted to be disposed in the grooves.

4,624,391

AUTOMATIC WINE DISPENSER

Joseph W. Shannon, Kent, Ohio, assignor to American Business Computers, Mogadore, Ohio

Filed Oct. 20, 1983, Ser. No. 543,877
Int. Cl.[4] B65B 55/00
U.S. Cl. 222—53 8 Claims

1. In a wine dispenser, an improvement including:

(a) first and second reservoirs connected by a flow conduit;

(b) a first valve for preventing reverse flow from said second reservoir to said first reservoir;

(c) bottle mounting means on the first reservoir for reeeiving an inverted bottle of wine for supplying a predetermined quantity of wine to the first and second reservoirs;

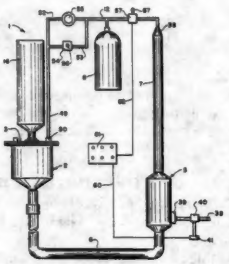
(d) a wine dispensing line connected to the second reservoir and having flow valve means interposed therein for controlling the flow of wine being dispensed from said second reservoir through said line;

(e) a vent valve communicating with the first reservoir for venting any air trapped within said first reservoir;

(f) a supply of pressurized nitrogen gas;

(g) gas line means connecting said first and second reservoirs and said supply of nitrogen gas, said gas line means including

(1) first control means connected between the supply of nitrogen gas and the first reservoir for purging air from said first reservoir and for maintaining a nitrogen enriched atmosphere therein above the level of the wine, said first control means including a demand regulator



which supplies a predetermined quantity of nitrogen gas to the first reservoir after each drink is dispensed from the second reservoir, a purge valve for supplying a sufficient quantity of nitrogen gas to the first reservoir to purge any air that is trapped in said first reservoir through the vent valve after placing a filled bottle of wine on said first reservoir, and said demand regulator and purge valve being connected in parallel; and

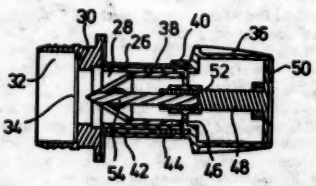
(2) second control means connected between the supply of nitrogen gas and the second reservoir for supplying pressurized nitrogen gas to said second reservoir for dispensing of wine therefrom, and for maintaining a nitrogen enriched atmosphere is contact with the wine in the second reservoir.

4,624,392

APPARATUS FOR DISPENSING LIQUIDS

Jon H. Malpas, Ocean Grove, and Alan R. Calder, Melbourne, both of Australia, assignors to Diemoulders Proprietary Limited, Leopold, Australia

Division of Ser. No. 323,665, Nov. 20, 1981, Pat. No. 4,469,249.
This application Aug. 13, 1984, Ser. No. 639,794
Claims priority, application Australia, Dec. 4, 1980, PE 6755; May 3, 1981, PE 9152; Aug. 14, 1981, PE 0260
Int. Cl.[4] B67D 3/04
U.S. Cl. 222—83 4 Claims



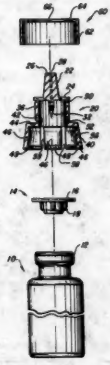
1. Apparatus for dispensing liquid from a container, the apparatus including a body for attachment to the container, a probe mounted within the body for upon use of the apparatus

to penetrate or rupture a frangible diaphragm at or adjacent the innermost end of the body, a handle and a retaining flange, the body having an inner part and a part provided with a hole, for receiving a hollow spigot having a cooperating hole, and the handle being of hollow construction and rotatable and having a gripping portion adapted to be held by a user whereby rotation of said handle will cause alignment of said holes for dispensing of liquid, said handle having a bearing member at the innermost end of the gripping portion, the bearing member being adapted to accommodate an axially extending rod the outer end of which is attached to a plate member located within the gripping portion and the inner end of which is attached to the probe so that the plate member upon being pushed will cause the probe to move to an axially inward position.

4,624,393
SPLIT HUB ASSEMBLY FOR A NECKED DOWN CARTRIDGE TUBE

Claudio Lopez, Silver Spring, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Filed Jul. 2, 1981, Ser. No. 279,956
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—83.5 **5 Claims**



1. A split hub assembly for use in conjunction with a cartridge assembly including a cylindrical cartridge tube having a necked down end terminating in an annular flange, said split hub assembly comprising:

a needle holder having a forward end and a rearward end with a passage connecting said ends, the forward end portion being adapted to receive a needle,

a cylindrical body having a forward end and a rearward end with its forward end extending rearwardly from the rearward end of the needle holder,

a plurality of flexible segments extending rearwardly from the rearward end of the cylindrical body, each segment having a locking lip extending inwardly from the free end of the segment,

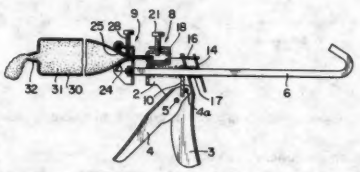
the cylindrical body having a first locking means adjacent the forward outer end portion of said body and a second locking means adjacent the rearward outer end of the body, and

a cylindrical sleeve having a forward end and a rearward end with an inside diameter sized to engage and force inwardly the flexible segments extending rearwardly from the rearward end of the cylindrical body, a flange extending inwardly from the forward end of said sleeve and sized to engage the first and then the second locking means on the cylindrical body, whereby with the cylindrical sleeve fitting down around the cylindrical body with the flange of the cylindrical sleeve engaging the first locking means on said cylindrical body and the flexible segments positioned over and around the annular flange on the cartridge tube rearward movement of the cylindrical sleeve causes said sleeve to engage the flexible segments and force them inwardly so that the locking lips fit in against the rearward portion of the annular flange to secure the split hub assembly to the cartridge tube, the flange of the cylindrical sleeve engaging the second locking means to retain said sleeve in position.

4,624,394
TUBE CONTAINER SQUEEZER

Masayuki Ushiro, Muko, Japan, assignor to Kyoto Kikai Kogu Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 29, 1983, Ser. No. 556,023
Claims priority, application Japan, Nov. 30, 1982, 57-180015[U]; May 18, 1983, 58-75017[U]
Int. Cl.[4] B65D *35/28*
U.S. Cl. 222—103 **1 Claim**



1. A tube squeezer for squeezing out the content of a collapsible tubular container of the type commonly called a tube, comprising:

(a) a main frame in the shape of a pistol, the lower portion of the frame having a grip and trigger-like actuating lever;

(b) a thrust rod having a rectangular form in transverse section and supported non-rotatably in a longitudinally slidable manner through the upper portion of the main frame;

(c) intermittent feeding means for intermittently moving the thrust rod by actuating the trigger lever, said feeding means being adapted to move forward the thrust rod when the trigger is actuated and the thrust rod remain at its position when the trigger is released;

(d) holding means formed on the front portion of the main frame and comprising a frame in the shape of the letter U laid on its side in a manner that the opening part is directed forward to receive the tail end of the collapsible tube, a fastening screw held by a horizontal flange portion of the U-shaped frame and a U-shaped nipping member supported by the fastening screw for tightly holding the tail end of the callapsible tube; and

(e) squeezing means fixed to the front end of the thrust rod in a position confronting the holding means for squeezing the collapsible tube when the thrust rod is moved foward by actuating the trigger, said squeezing means comprising a body fixed to the front end of the thrust rod, the body being provided with a vertical wall having an opening through which the tail end of the tube passes to be held by the nipping member of the holding means, said squeezing means further comprising two squeezing members between which the tube is pressed while the members move on and along the opposite surfaces of the collapsible tube with its tail end held by the holding means, at least one of the squeezing members being pivotable around a pin at its forward end so that the space therebetween is adjustable, the tubing being passed through the space, the two squeezing members comprising two squeezing plates which are respectivcly in the shape of an arc in vertical section, said squeezing plates being so opposed to each other that they form a trumpet-like form in vertical section, and an adjusting screw for adjusting the space between the two squeez-

ing plates, the tube being pressed between the squeezing members while the squeezing means is moved forward on the surface of the tube.

4,624,395

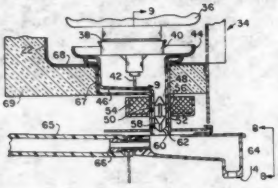
HOT BEVERAGE DISPENSING MACHINE

Richard D. Baron, Zephyrhills; Michael H. Jones, Clearwater, and David E. Kent, Palm Harbor, all of Fla., assignors to Lykes Pasco Packing Co., Zephyrhills, Fla.

Filed May 11, 1984, Ser. No. 609,240

Int. Cl.[4] B67D *5/56, 5/62*; E21B *33/00*; F25B *21/02*

U.S. Cl. 222—129.1 **30 Claims**



1. A beverage dispensing machine comprising in combination:

a beverage concentrate container;

a refrigerated compartment for the reception of said concentrate container;

a first valve associated with said container, said first valve permitting the flow of said concentrate from said container when said container is located within said refrigerated compartment;

said first valve including a cap which cooperates with an opening defined by said container;

a passageway defined by said cap;

a valve seat disposed adjacent a first end of said passageway;

a flexible perforate diaphragm secured adjacent the periphery thereof between said container and said cap;

a closure disposed integrally with said diaphragm, said closure cooperating with said valve seat; and

a valve actuator extending through said passageway enabling said closure to be lifted from said valve seat upon axial movement of said first valve actuator to permit flow of concentrate from said container to said passageway;

a receptacle removably receiving said first valve;

a receptacle output disposed adjacent said receptacle;

a first electrically controlled valve for controlling the flow of said concentrate from said receptacle output;

a water tank for containing water;

a water inlet in fluid communication with said tank and said mixer;

a second electrically controlled valve for controlling the flow of water to said mixer to effect mixing of said concentrate and said water within said mixer; and

a dispenser spout disposed in fluid communication with said mixer, said spout being disposed remote from said inlet and said receptacle output.

4,624,396

GARMENT HANGER

Samy F. Universe, 12300 Sherman Way, North Hollywood, Calif. 91605

Filed Oct. 28, 1985, Ser. No. 791,984

Int. Cl.[4] A41D *27/22*

U.S. Cl. 223—92 **3 Claims**

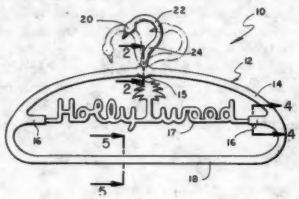
1. A garment hanger comprising, in combination:

(a) a hook;

(b) a hanger body;

(c) an ornamental sign, said sign including opposed protruding members, each of said male members having a predetermined cross section;

(d) said hanger body including generally transversely-arranged upper, mid- and lower members;



(e) said mid-member including an open central portion for accommodating said ornamental sign; and

(f) said mid-member further including cavities of said predetermined cross section for engaging said male members of said ornamental sign.

4,624,397

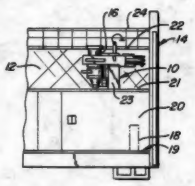
HYDRANT COUPLER VALVE BRACKET

Gary Muto, 35811 Augustine Pl., Fremont, Calif. 94536

Filed Jul. 8, 1985, Ser. No. 752,604

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—42.45 R **8 Claims**



1. A mounting rack for a Carlin valve or the like, the mounting rack being constructed and arranged for mounting to a vertical surface such as a back panel of a fire truck comprising:

a mounting member adapted for fixed connection to a vertical surface;

a vertically oriented support member connected to the mounting member and having means for articulating the support member about a vertical axis with respect to said mounting member;

first and second parallel, spaced elongated guide members projecting from the support member and horizontally disposed for unitary articulation with the support member, the guide members being adapted to receive a neck portion of the Carlin valve between the two guide members;

first locking means for selectively engaging and locking the support member relative to the mounting member with the parallel spaced guide members positioned perpendicular to the vertical surface; and

second locking means for retaining the Carlin valve in the mounting rack when the support member is locked relative to the mounting member, wherein said first and second locking means are part of a unitary structure having a hand grip section enabling concurrent release of said first and second locking means.

4,624,398

TAPE DISPENSING AND CUTTING RECEPTACLE

Michael J. Girardi, and Marilyn A. Girardi, both of 48 Union Blvd., Wallington, N.J. 07057

Filed Aug. 30, 1985, Ser. No. 771,518
Int. Cl.[4] B26D *1/02*
U.S. Cl. 225—21 7 Claims

1. An improved tape dispensing and cutting receptacle having oblong-shaped top and bottom portions adapted to complementarily mate with each other, wherein the improvement comprises the combination of:

(a) a plurality of spool-holding pegs each affixed to and extending from the floor of said bottom portion, said pegs respectively defining first and second spool-dispensing axes, with a plurality of tape rolls disposed upon said pegs in each of said axes;

(b) first and second longitudinally-oriented inner ridges depending from said upper portion, said ridges each defining a longitudinal axis, said ridges protruding in the direction of said pegs when said top portion is mated with said lower portion, said ridges touching the exposed radial surface of said tape rolls with a frictional contact sufficient to preclude unwanted wobbling of a corresponding tape roll during the dispensing thereof;

(c) first and second longitudinally-oriented outer ridges, comprising a first tape-dispensing guide means, said outer ridges disposed substantially parallel to said inner ridges and outward therefrom from said bottom and top portions;

(d) a plurality of tape exit and flattening apertures formed by the intersection of the perimeters of said bottom and top portions, in which tape from said spools is guided by said outer ridges through said exit and flattening apertures; and

(e) second tape-dispensing guide means, comprising a plurality of resilient tab elements extending outwardly from the walls of said bottom portion in a direction transverse thereto, said second guide means acting to both properly orient the tape as it is being extended from the tape spools prior to cutting and acting to return said tape, after cutting, to a convenient next-cut position, as well as freeing said tape from a cutting surface of the inventive dispensing and cutting receptacle.

4,624,399

GRIPPING DRIVE FOR MAGNETIC TAPE

Jean-Pierre Merle, Clamart, France, assignor to Enertec, Montrouge, France

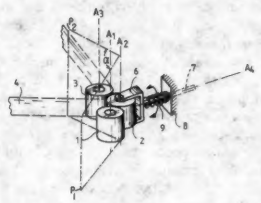
Filed Mar. 19, 1985, Ser. No. 713,717
Claims priority, application France, Mar. 19, 1984, 84 04197
Int. Cl.[4] B65H *20/02*
U.S. Cl. 226—181 8 Claims

1. Apparatus for driving a magnetic tape, comprising:

a drive roller rotatable about a fixed first axis for providing drive for the tape;

a pinch roller rotatable about a second axis;

a idler roller around which the tape passes, said idler roller being spaced apart from said drive roller and rotatable about a fixed third axis substantially parallel to the first axis; and



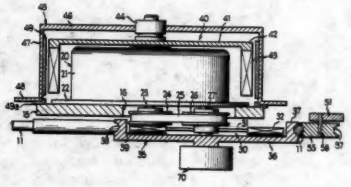
pinch roller mounting means for urging said pinch roller along a direction such that said pinch roller simultaneously impinges against both the tape passing around said idler roller and said drive roller such that said second axis is substantially parallel with said first and third axes, said pinch roller mounting means being rotatable about a fourth axis substantially perpendicular to the second axis and substantially parallel to the direction along which the pinch roller is urged.

4,624,400

ELECTROMAGNETIC PROBE DRIVE APPARATUS

John J. Zimmer, Turtle Creek, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,029
Int. Cl.[4] B65H *17/22*
U.S. Cl. 226—188 4 Claims



1. Apparatus for driving a probe through the interior of individual tubes of a nuclear reactor steam generator, said probe comprising an inspection device for said tubes and said probe connected to an elongated flexible probe carrier, said apparatus comprising:

a rotatable drive member having a cylindrical drive surface, holding means comprising an arcuate shoe member carrying a plurality of spaced idler rollers, a portion of said elongated flexible probe carrier operable to be retained between a portion of said cylindrical drive surface and said idler rollers with a predetermined frictional force in non-slipping engagement so that rotation of said cylindrical drive surface of said rotatable drive member causes said elongated flexible probe carrier to move with said cylindrical drive surface without slippage;

motive means comprising a drive motor having a motor drive shaft; and

electromagnetic clutch means providing a remotely controllable and variable degree of magnetic coupling force between said motor drive shaft and said rotatable drive member for normally rotating said cylindrical drive sur-

face of said rotatable drive member to drive said elongated flexible probe carrier and the probe connected thereto through individual ones of said tubes, and the remotely controllable coupling force exerted by said electromagnetic clutch means betweens said motor drive shaft and said rotatable drive member being maintained at less than the predetermined frictional force exerted by said holding means so that in the event motion of said probe through any of said tubes is impeded, said electromagnetic clutch means will be decoupled with respect to transmitting the motion of said motor drive shaft to said rotatable drive member thereby arresting motion of said elongated probe carrier and said probe without causing slippage between said cylindrical drive surface and the portion of said elongated probe carrier which is in contact therewith, the coupling force exerted by said electromagnetic clutch means also being remotely variable so that in the event motion of said probe through any of said tubes is impeded by an obstruction, the coupling force can be remotely increased to exert the necessary coupling force to overcome the obstruction.

4,624,401

DEVICE FOR DRIVING FASTENING ELEMENTS

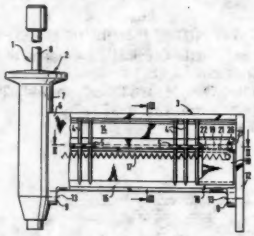
Theo Gassner, Triesenberg, Liechtenstein, and Rolf Fehr, Buchs, Switzerland, assignors to Hilti Aktiengesellschaft

Filed Jul. 16, 1985, Ser. No. 755,422

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1984, 3426173

Int. Cl.⁴ B25C *1/00, 3/00, 5/00;* **B27F** *7/13*

U.S. Cl. 227—125 **3 Claims**



1. A device for driving fastening elements, includes means for driving the fastening elements in a first direction, a magazine for holding the fastening elements and for delivering the fastening elements to said means, said magazine being elongated in a second direction extending transversely of the first direction and having a first end through which the fastening elements are supplied to said driving means and a second end spaced outwardly from said means, a follower located within said magazine for moving the fastening elements in the second direction toward said first end of said magazine, said follower being displaceable in the second direction outwardly from said driving means to a loading position for placing fastening elements into said magazine, said follower has a stop thereon and said magazine has an abutment so that in the loading position said stop engages said abutment and retains said follower against displacement in the second direction toward said driving means, said follower includes means for pivoting said stop about an axis extending transversely of the second direction, an engagement part on said follower spaced from and in cooperating relation with said stop, and an actuating member movably displaceable on said magazine for contacting said engagement part and pivotally displacing said stop about the axis of said pivot means for releasing said follower out of the loading position, said follower includes a rocking lever having a pair of oppositely directed arms with the end of one arm forming said stop and the end of the other arm forming said engagement part, said follower includes a follower body, said means for pivoting said stop comprises a pivotal joint member forming the pivot axis and articulating said rocking lever to said follower body, said pivotal joint member comprises a connector web attached at one end to said follower body and at the other end to said rocking lever, and said follower body, said connector web and said rocking lever being formed monolithically.

4,624,402

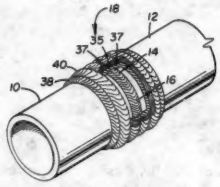
METHOD FOR APPLYING AN OVERLAY WELD FOR PREVENTING AND CONTROLLING STRESS CORROSION CRACKING

David Pitcairn, Morgan Hill, and Peter Riccardella, San Jose, both of Calif., assignors to Nutech, Inc., San Jose, Calif.

Filed Jan. 18, 1983, Ser. No. 458,898

Int. Cl.⁴ B23K *9/225, 31/06*

U.S. Cl. 228—119 **8 Claims**



1. A method for controlling and repairing a crack caused by stress corrosion cracking in a heat affected zone on the inner diameter of a welded pipe joint comprising the steps of applying to the outer diameter of the pipe an overlay weld including a plurality of circumferentially and continuously applied weld beads over the pipe joint with the crack and extending said overlay weld on each side of the pipe joint beyond the extremities of the heat affected zone on the inner diameter.

4,624,403

METHOD FOR BONDING CERAMICS TO METALS

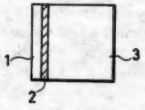
Akiomi Kohno, Ibaraki; Susumu Hioki, Kashiwa; Toshihiro Yamada, Ibaraki; Kazuaki Yokoi, Ibaraki, and Akihiko Yamamoto, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,253

Claims priority, application Japan, Dec. 14, 1983, 58-234216

Int. Cl.⁴ B23K *20/22*

U.S. Cl. 228—122 **4 Claims**



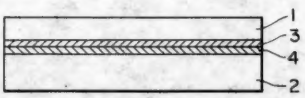
1. A method for bonding a non-oxide ceramic to a metal which comprises bonding an intermediate material comprising at least one member selected from the group consisting of metals of the group VIb and VIII of the Periodic Table to the metal by diffusion bonding, abutting the intermediate material against the non-oxide ceramic and heating the resulting assembly under pressure at a temperature lower than the fusion temperature of the intermediate material to bond the assembly together and, thereafter, maintaining the bonded assembly at a constant temperature lower than the heating temperature under a constant pressure higher than the pressure applied in the heating step for a time sufficient to cause plastic deformation in the intermediate material.

4,624,404

METHOD FOR BONDING CERAMICS AND METALS

Takashi Ohmae; Yasuhiro Fukaya, and Shozo Hirai, all of Kanonshin, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 13, 1984, Ser. No. 681,020
Claims priority, application Japan, Dec. 19, 1983, 58-237986
Int. Cl.[4] H01L *23/02*
U.S. Cl. 228—198 6 Claims



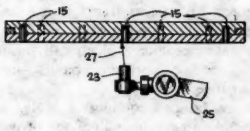
1. A method for bonding Si_3N_4 or SiC ceramics and metals which comprises the steps of depositing, on the ceramic material, an insert material consisting of a mixture of at least one metal selected from the group consisting of Ni and Cu and at least one metal compound selected from the group consisting of metal oxides, nitrides and carbides by ion plating or spray coating, subjecting the deposited insert material to thermal reaction-promoting treatment to permit strong metallurgical bond between the insert material and the ceramic material, and brazing a metal member and the surface of the insert material with a brazing material having a melting point lower than a melting point of the insert material.

4,624,405

CONSTRUCTION METHOD FOR PLACING UPRIGHT PINS IN A BASE PLATE

Chester W. Newell, 919 Camellia Way, San Jose, Calif. 95117

Filed Dec. 31, 1985, Ser. No. 815,151
Int. Cl.[4] B23K *26/08, 26/02, 5/22*
U.S. Cl. 228—212 12 Claims



1. A method for constructing upright pins in a base plate comprising,

making a first set of holes orthogonal to the plane of a planar base plate, said holes being slightly oversize with respect to pins to be seated therein, the holes extending completely through said base plate, said base plate having first and second opposed major surfaces,

placing a plurality of pins to be seated in said first set of holes in light frictional engagement with a second set of holes in a holder plate, said second set of holes being a positional mirror image of the first set of holes, with free ends of said pins projecting from the holder plate in an upright manner,

bringing the holder plate into close overlaying proximity to the base plate with free ends of said pins extending from the holder plate into said first set of holes from the first major surface side of the base plate so that the pins are flush with the second major surface side of the base plate,

welding the pins into their respective holes from the second major surface side of the plate with a welding apparatus, and

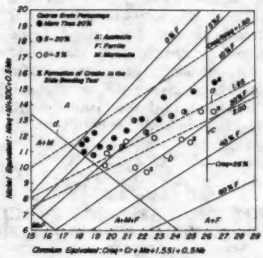
freeing said pins from said holder plate so that the pins are supported solely by said base plate.

4,624,406

OVERLAY WELDING METHOD

Koichi Yasuda, Chiba; Syozaburo Nakano, Mobara, and Noboru Nishiyama, Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP83/00206, § 371 Date Feb. 24, 1984, § 102(e) Date Feb. 24, 1984, PCT Pub. No. WO84/00122, PCT Pub. Date Jan. 19, 1984
PCT Filed Jun. 29, 1983, Ser. No. 585,274
Claims priority, application Japan, Jun. 29, 1982, 57-110739
Int. Cl.[4] B23K *9/04, 35/22*
U.S. Cl. 228—263.15 1 Claim



1. In an overlay welding method of the type including overlay welding a surface layer of stainless steel or nickel alloy on a base metal of carbon steel or low alloy steel, the improvement comprising previously overlay welding an austenitic stainless steel welded metal layer having a ratio of chromium equivalent (Creq), given by the following equation, to nickel equivalent (Nieq), given by the following equation, being more than 1.85, the chromium equivalent of less than 26%, and delta-ferrite phase of less than 20%, and no martensite phase, on the base metal as an intermediate layer and then overlay welding the surface layer thereon:

$$Creq = \%Cr + \%Mo + 1.5 \times \%Si + 0.5 \times \%Nb$$

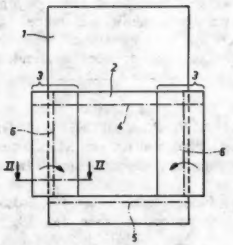
$$Nieq = \%Ni + 30 \times \%C + 0.5 \times \%Mn.$$

4,624,407

PACKAGE AND METHOD FOR FABRICATION THEREOF

Veikko I. Janhonen, Långvik, 02420 Jorvas, Finland

PCT No. PCT/FI84/00030, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/04083, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 13, 1984, Ser. No. 686,266
Claims priority, application Finland, Apr. 14, 1983, 831255
Int. Cl.[4] B65D *37/00, 35/20*
U.S. Cl. 229—1.5 R 2 Claims



1. An envelope shaped package having reinforced end walls, said package comprising:

a first elongated rectangular sheet of a stiff cardboard type

material, said sheet having three panels separated by laterally extending fold lines, one of said panels being a back panel, a second panel being a front panel, and the third panel being a closure flap, the fold line between said front and back panels defining a bottom of said package; and

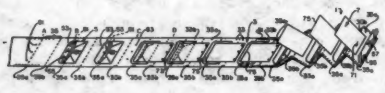
a second elongated rectangular sheet of flexible material arranged at right angles to said first sheet and overlying said back panel, a portion of said second sheet extending over the fold line between said front and back panels and overlying said front panel, the length of said second sheet being greater than the width of said first sheet, the ends of said second sheet extending laterally beyond each lateral edge of said first sheet and being folded back upon and bonded to themselves along fold lines spaced outwardly from said lateral edges of said first sheet, to form double thickness end panels, said end panels being folded along fold lines spaced inwardly from said lateral edges of said first sheet and bonded to said front panel, the portions of the end panels overlying the front panel being folded against the portions of the end panels overlying said back panel to seal and reinforce the bottom and bottom corners of the package.

4,624,408

CARRIER SHEET ASSEMBLY INCLUDING CONTINUOUSLY OVERLAPPED ENVELOPES AND LETTER HEADS

H. Richard VerMehren, 1395 Yaqui Dr., Florissant, Mo. 63031

Division of Ser. No. 449,519, Dec. 13, 1982, Pat. No. 4,514,182.
This application Feb. 14, 1985, Ser. No. 701,732
Int. Cl.[4] B65D *27/10*
U.S. Cl. 229—69 **6 Claims**



1. A carrier sheet system characterized by continuously overlapped envelopes and letter sheets, said system comprising

a fanfolded carrier sheet, said carrier sheet comprising a plurality of panels fanfolded to form alternate upper and lower panels connected by alternate infolds and outfolds,

a plurality of closed envelopes affixed to upper panels of said carrier sheet, said envelopes comprising a body part and a closure flap connected to the body part along a closure flap fold,

a plurality of separate letter sheets affixed to said upper panels of said carrier sheet to which said envelopes are affixed,

said closure flaps of said envelopes being affixed to said carrier sheet with said closure flap folds parallel to infolds between carrier sheet panels, said bodies of said envelopes overlapping the said letter sheets affixed to corresponding panels of said carrier sheet,

said letter sheets extending a distance beyond the panels to which they are mounted by a distance sufficient that said letter sheets and said envelopes are continuously overlapped when said carrier sheet is extended.

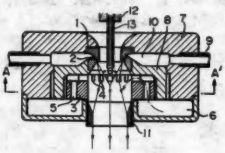
4,624,409

APPARATUS FOR FINELY DIVIDING MOLTEN METAL

Tohru Takeda, Yamato, and Kazumi Minagawa, Matsudo, both of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Jan. 14, 1985, Ser. No. 691,312
Claims priority, application Japan, Jan. 19, 1984, 59-6352
Int. Cl.[4] B22F *9/08*
U.S. Cl. 239—11 **7 Claims**

1. An apparatus for finely dividing a molten metal by atomization, comprising a nozzle for feeding a molten metal and an annular atomizing nozzle for jetting a high-pressure liquid against a stream of the molten metal flowing from the feed nozzle, said atomizing nozzle comprising an annular jetting zone adapted to form a narrow opening therein under the pressure of the high-pressure liquid, an inside jacket and an



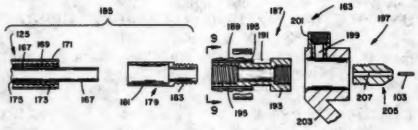
outside jacket adjacent to said annular jetting zone, and said apparatus further including a pressure reduction chamber located beneath the atomizing nozzle and communicating with the lower part of the jet from the atomizing nozzle.

4,624,410

LEAD CABLE AND SPRAY HEAD FOR ARC METAL SPRAY APPARATUS

Frank S. Rogers, 4955 NW. Gustafson Rd., Silverdale, Wash. 98383

Division of Ser. No. 435,022, Oct. 18, 1982, Pat. No. 4,512,513.
This application Jan. 24, 1985, Ser. No. 694,364
Int. Cl.[4] B05B *7/18, 7/22;* H01B *7/34*
U.S. Cl. 239—83 **30 Claims**



1. A lead cable for arc metal spray apparatus for carrying power, high pressure gas, and spray wire to a spray head having contact tips, which comprises:

(a) a cylindrical inner liner of electrically insulating material through which the spray wire passes, uninterrrupted to the contact tips;

(b) a cylindrical braided conducting cable, concentric with and surrounding said inner liner for providing electrical power to the spray head; and

(c) an outer cylindrial liner of concentric with and surrounding said braided cable, the inner wall of said liner being disposed away from said braided cable to provide an annular passage for high pressure gas to the spray head; and

wherein the inner surface of said braided cable is disposed away from the outer surface of said inner liner to provide an annular passage and further including an end assembly comprising:

(d) a braid capture cylindrical coupling having a thin wall braid capture section and an externally threaded section, said thin wall section being disposed between the outer surface of said braided cable and the inner surface of said outer liner and fixed to said braided cable to provide electrical connection between the braided cable and the capture coupling;

(e) a capture member having a longitudinal channel, said longitudinal channel having at a first end a first threaded section configured to mate with the externally threaded section of the braid capture coupling and a second threaded section at the other end, the outer surface of said capture member having a first section to which the outer liner of said lead cable may be secured and an annular

groove around the central portion thereof forming an annular air cavity, said capture member further including longitudinal passages from said annular groove through said capture member toward said first end;

(f) a collar for mating with the capture member at said second end, said collar having a passage communicating with the annular air cavity of said capture member for suolying pressurized gas to said lead cable, said collar having means for attachment of an electrical power lead; and

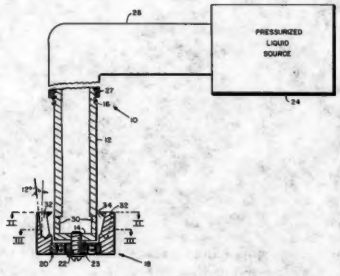
(g) a feed member having external threads for mating with the second threaded section of said capture member, said feed member having a central passage through which the spray wire passes.

4,624,411

SELF-PROPELLED, ROTARY, LIQUID ATOMIZER

Vann Y. Won, 6697 Gloria Dr., Sacramento, Calif. 95831

Filed Jan. 8, 1985, Ser. No. 689,738
Int. Cl.[4] B05B *3/04, 3/10*
U.S. Cl. 239—222.19 **4 Claims**



1. A self-propelled, rotary, liquid atomizer, comprising:

means for providing a source of liquid under pressure;

a feed tube operably connected at one end thereof to said pressurized liquid source, said feed tube including an elongated structure having a hollow interior surrounded by a side wall and closed at the other end thereof, and plurality of slits in said side wall adjacent said closed end for permitting said pressurized liquid to pass therethrough, said slits in said side wall of said feed tube being configured to be substantially tangential to the circumference of the inside wall surface of said feed tube;

a ball bearing assembly rotatably secured to said closed end of said feed tube;

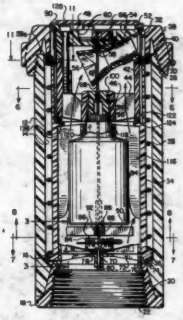
a rotor fixedly secured to said ball bearing assembly for rotation therewith, said rotor being in the form of a body having a plurality of circumferentially spaced apart holes formed only on the top surface of said body and extending longitudinally approximately midway through said body, with that portion of said body encompassing each of said holes, respectively, having an opening therein adjacent each of said slits in said side wall of said feed tube in order to receive said liquid therethrough such that said pressurized liquid acts as the motive force as it impinges upon said body of said rotor surrounding said holes in order to rotatably drive said rotor as well as causing atomization of said liquid to take place as said liquid exits from each of said holes in the top surface of said body of said rotor.

4,624,412

REVERSIBLE TURBINE DRIVEN SPRINKLER UNIT

Edwin J. Hunter, 5551 Codorniz Rd., Rancho Santa Fe, Calif. 92067

Filed Sep. 10, 1984, Ser. No. 648,949
Int. Cl.[4] B05B *3/04, 15/10, 1/26*
U.S. Cl. 239—232 **17 Claims**



1. A reversible sprinkler unit comprising:

a cylindrical tubular housing having an axis and inlet means for attachment to a source of pressurized water;

a sprinkler nozzle directed outward at an angle to and mounted for rotation about said axis of said housing and communicating with said inlet means;

a reversible turbine mounted in said housing for rotation about the axis of said housing and drivingly connected to said nozzle for rotating said nozzle in alternate directions about said axis, said turbine including reversible stator means;

flow interrupting means intermittently driven in one of said alternate directions by said sprinkler nozzle as said sprinkler nozzle rotates in said one direction and held stationary as said sprinkle nozzle rotates in the other of said alternate directions; and

shifting means for shifting said stator to respective reversible positions including a torsion shaft member rotatably mounted and extending coaxial of said turbine and said housing.

4,624,413

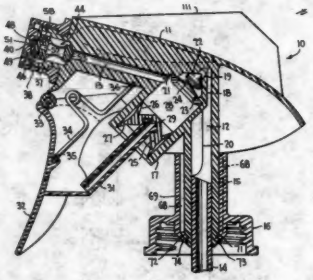
TRIGGER TYPE SPRAYER

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Filed Jan. 23, 1985, Ser. No. 694,101
Int. Cl.[4] B05B *1/34, 11/00*
U.S. Cl. 239—333 **13 Claims**

1. A liquid dispensing pump, comprising a pump body adapted to be mounted on a container of flowable product to be dispensed, said body having a pump cylinder, a piston reciprocable in said cylinder and therewith defining a variable volume pump chamber, said pump body having valve-controlled inlet and outlet means for delivering liquid product into and out of said pump chamber, means for manually reciprocating said piston, a nozzle cap having a discharge orifice and being mounted for rotation between a discharge closed position and at least two selective discharge open positions without axial displacement on said pump body at the end of said outlet means, an element disposed within said nozzle cap and mounted on said pump body, said nozzle cap having an inner surface, and said element comprising a housing having an outer surface spaced from said inner surface to therewith define a circular spin chamber, a wall of said nozzle cap engaging a wall of said housing, said cap wall having at least two spaced apart tangential openings at said inner surface leading into said

spin chamber, said housing wall having at least two spaced apart supply channels, said openings and said channels solely comprising discharge flow path means and being relatively arranged such that upon rotation of said cap into said discharge closed position said openings and said channels are mismatched, upon rotation of said cap into a first of said discharge open positions one of said channels and one of said openings



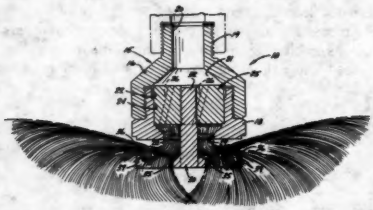
are matched, and upon rotation of said cap into a second of said discharge open positions of both of said channels and both of said openings are matched, whereby the liquid product is discharged through said discharge orifice at an essentially constant discharge capacity solely via said tangential openings at a swirl velocity and in a pattern range depending on said discharging open positions.

4,624,414

DEFLECTOR TYPE SPRAY NOZZLE FOR FIRE PROTECTION AND OTHER SYSTEMS

Gerald Ferrazza, Schaumburg, Ill., assignor to Spraying Systems Co., Wheaton, Ill.

Filed Apr. 13, 1984, Ser. No. 600,118
Int. Cl.⁴ B05B *1/26, 1/34*
U.S. Cl. 239—467 **8 Claims**



1. A deflector type spray nozzle for fire protection systems and the like adapted to discharge a spray pattern in a nearly horizontal direction and comprising, in combination

(a) a hollow body having an inlet adapted for connection to a fire main;

(b) means defining a vane chamber in said body substantially larger in diameter than said inlet;

(c) means defining a frustoconical whirl chamber adjacent the end of said body remote from said inlet and defining an outlet for said body;

(d) a multi-bladed vane telescopically housed within said vane chamber having a plurality of generally helical passages defined therein communicating between said inlet and said whirl chamber for imparting a tangential swirling movement to liquid passing through said helical passages;

(e) means in said body precluding rotation of said vane relative thereto; and

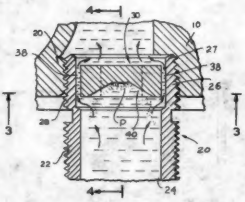
(f) deflector plate means having a diameter greater than the diameter of said vane and whirl chambers connected to said body and disposed in relatively closely spaced relation to said body outlet, said deflector plate means having a concave deflector section opposite said outlet and being formed with a plurality of radial diffusion slots extending from the periphery of said deflector plate means into intersecting relation with said concave deflector section for diffusing swirling liquid exiting said outlet in a substantially horizontally directed and symmetrical spray pattern with substantial uniformity in distribution throughout the area of the spray pattern, and said deflector plate means being spaced sufficiently from said body outlet such that the body and deflector plate means do not define a flow restriction for nozzling the diffused liquid leaving the deflector plate means.

4,624,415

CONTROL ASSEMBLY

Edward G. Hofstetter, Jr., Fairhaven, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,144
Int. Cl.⁴ B05B *1/14;* F01N *3/02;* E03B *3/18;* F16L *9/14*
U.S. Cl. 239—590.3 **11 Claims**



1. A nozzle having a fluid passageway and fluid inlet and outlet openings at opposed ends thereof, said nozzle comprising:

a fluid control assembly positioned adjacent said fluid inlet opening of said nozzle passageway and being in fluid communication therewith;

said fluid control assembly including a cylindrical housing having an inner wall surface and a flow restrictor means;

said flow restrictor means shaped in the form of a polygon and having a plurality of vertical faces extending around the periphery thereof;

said polygon being mounted in said housing so that the vertices thereof contact the inner wall surface of said housing to provide a plurality of vertically extending passageways between each vertically extending face of said polygon and the inner wall surface of said housing;

said polygon having transversely extending, opposed end faces so that fluid is conducted only through said vertically extending passageways;

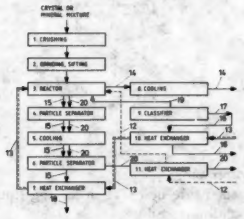
noise suppressing means is formed by the intersection of each of said vertical faces of said polygon with one of said transversely extending end faces at the fluid inlet opening of said fluid passageways, whereby the flow of fluid passing through said plurality of fluid passageways is decreased and noise of fluid passing through said nozzle passageway is reduced; and

said opposed end face positioned at the fluid inlet opening of said nozzle passageway, includes an axially formed recess to provide particle diverting means whereby clogging of said fluid passageways is substantially reduced.

4,624,416
PROCEDURE FOR CLASSIFYING A CRYSTAL MIXTURE OR CONCENTRATING ROCKS OR MIXED CRYSTALS IN PARTICLE FORM

Kjell A. M. Dahlberg, and Urho V. Valtakari, both of Pargas, Finland, assignors to Oy Partek AB, Parainen, Finland

Continuation of Ser. No. 459,560, Jan. 20, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 716,591
Claims priority, application Finland, Jan. 20, 1983, 820322
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—1 **6 Claims**



1. A process for classifying a raw material in particle form comprising a mixture of at least two types of crystalline particles which have closely similar specific gravities at room temperature and one of which expands in volume to a substantially greater extent than the other when subjected to heat, said process comprising:

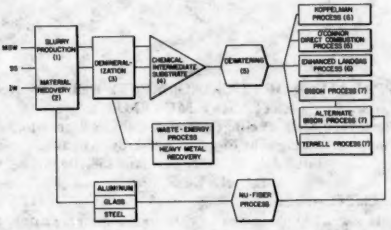
(a) subjecting said mixture to heat sufficient to effect said expansion in volume and relative decrease in specific gravity of said crystalline particles of said one type, and

(b) subjecting said heated mixture to gravitational force effecting separation of said more greatly expended particles of said one type from the remainder of said mixture.

4,624,417
PROCESS FOR CONVERTING SOLID WASTE AND SEWAGE SLUDGE INTO ENERGY SOURCES AND SEPARATE RECYCLABLE BY-PRODUCTS

Alfred J. Gangi, Lawrence, Mass., assignor to Newest, Inc., Reno, Nev.

Continuation-in-part of Ser. No. 505,180, Jun. 17, 1983, abandoned. This application Jun. 11, 1984, Ser. No. 619,495
Int. Cl.[4] B02C *11/08, 21/00, 23/08*
U.S. Cl. 241—17 **13 Claims**



1. A method for processing waste into a chemical intermediate substrate for production of energy sources and non-energy related by-products comprising:

(1) producing a slurry of organic and inorganic materials by pulping;

(2) separating the organic and inorganic materials shredded in step 1 by centrifuging out remaining inorganic components in the slurry of step (1) to produce a predominately organic slurry;

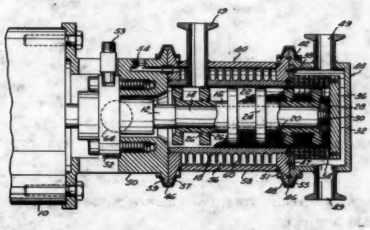
(3) demineralizing and detoxifying the organic slurry of step (2); and

(4) forming a chemical intermediate substrate by stabilizing, dewatering, and storing the demineralized organic material of step (3).

4,624,418
MEDIA MILL OUTLET ASSEMBLY

Edward J. Szkaradek, Santa Ana, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 663,049, Oct. 19, 1984, and Ser. No. 627,918, Jul. 5, 1984, abandoned. This application Jun. 21, 1985, Ser. No. 746,440
Int. Cl.[4] B02C *17/18*
U.S. Cl. 241—46.17 **23 Claims**



1. Milling apparatus comprising:

a generally cylindrical vessel for receiving grinding media and a liquid having small particles therein which are to be milled or reduced in size within the vessel;

a motor driven rotor in the vessel for agitating the grinding media;

a liquid inlet through which said liquid is introduced as the grinding media is agitated by the rotor;

a liquid outlet section for said vessel including a generally cup-shaped housing having a cylindrical side wall and an end wall;

a plurality of ring-shaped screen elements arranged in a stack within said cylindrical wall defining a cylindrical space;

structure attached to said housing for spacing the periphery of the screen elements from said cylindrical wall to define an annular passage;

means for axially holding said stack within said housing;

said screen elements having slots formed in their axial faces so that the slots and the adjacent screen elements define openings extending between said annular passage and said cylindrical space, said openings being sized to prevent the grinding media from passing into the openings, and said openings being relatively straight and direct to minimize pressure drop across the opening and to minimize clogging of said openings by media particles or product; and

an outlet in said housing through which the liquid may exit from the vessel after passing through said screen openings.

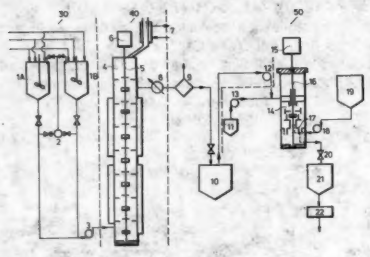
4,624,419
APPARATUS FOR PREPARING AQUEOUS AND OILY, SULFUR CONTAINING PRODUCTS

Jenö Hevesi; János Gyapai; Gábor Szudy; Bálint Nagy; Árpád Vágó; Ádámné N. Gesztelyi, and József Keszler, all of Veszprém, Hungary, assignors to Nehézvegyipari Kutató Intézet, Veszprém, Hungary

Filed May 15, 1984, Ser. No. 610,534
Claims priority, application Hungary, May 27, 1983, 1878/83
Int. Cl.[4] B02B *5/02;* B01F *15/06, 13/00*
U.S. Cl. 241—101 B **4 Claims**

1. Apparatus for producing aqeueous, oily, sulfur containing products by producing a dispersion from a sulfur ingredient, oil and a surfactant, comprising wet grinding means for adjusting the particle size of a component of said sulfur ingredient, a

reactor for producing said sulfur ingredient from its components at elevated temperature, a first pump for transporting the components of said sulfur ingredient to said reactor, a cooler for cooling the aqueous sulfur ingredient solution and solid residue from said reactor, separating means for separating the sulfur ingredient solution from the solid residue, dispersing



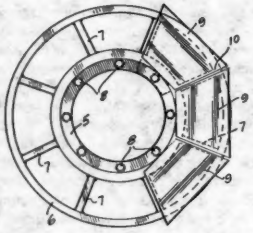
means for emulsifying oil with the aid of a surfactant in said aqueous sulfur ingredient solution, containers each for storing said oil and said surfactant, second and third pumps for charging respectively oil and surfactant into said dispersing means, and means for recovering the aqueous, oily, sulfur containing emulsion product.

4,624,420

REFINING DISC FOR WOOD PULP OR THE LIKE

Milton Pilao, Rua Manoel de Gois, 409, 05604 Sao Paulo, Brazil

Filed Jul. 26, 1984, Ser. No. 634,617
Claims priority, application Brazil, Jul. 28, 1983, 8304028
Int. Cl.[4] B02C *7/11*
U.S. Cl. 241—298 **6 Claims**



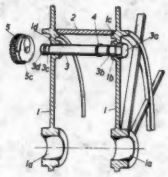
1. In a rotor disc assembly having a rotor disc and at least one refining disc coaxially connected thereto, the improvement comprising a central hub for mounting the rotor disc and including at least two diametrally opposing fins radially outwardly extended therefrom, and a peripheral ring formed with a plurality of uniformly circumferentially spaced perforations, said refining disc being attached to said peripheral ring at said perforations, said refining disc including a frame which includes an inner ring, an outer ring concentrically positioned with said inner ring, said inner ring being formed with perforations in correspondence with those of said peripheral ring of said hub, said inner and outer rings being connected to each other by radially extended rods and defining two end faces of the frame, said refining disc further including a plurality of stainless-steel plates of trapezoidal shape, said plates being attached to each end face of said frame by welding, said plates on each end face of said frame being spaced from each other by gaps filled with weld beads.

4,624,421

REEL

Shinobu Takeuchi, 69-2, Aza Minamikawaharada, Motomiyamachi, Adachi-gun, Fukushima-ken, Japan

Filed Jan. 23, 1985, Ser. No. 694,044
Claims priority, application Japan, May 18, 1984, 59-72021[U]
Int. Cl.[4] B65H *75/22*
U.S. Cl. 242—77 **5 Claims**



1. A reel comprising:

a pair of spaced side plates each having the form of a disc made of synthetic resin;

aligned axial holes in said side plates to provide an axis of rotation for the reel;

a plurality of pairs of aligned rod inserting holes in said side plates radially spaced outwardly with respect to said axial holes and circumferentially spaced with respect to each other;

reel collar engaging steps on the inner facing surfaces of said side plates;

a cylindrical reel collar inserted between said side plates and engaging at its ends with said steps for spacing said side plates apart;

a rod member removably insertable in each aligned pair of rod inserting holes;

removable locking means at one end of each rod member for retaining said rod member engaged with said side plates; and

means at the other end of each rod member for resiliently urging said side plates toward each other to retain said reel collar therebetween.

4,624,422

APPARATUS FOR LOCKING SAFETY BELT AGAINST EXTENSIVE MOVEMENT

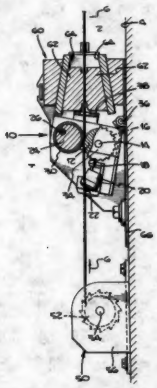
William Hollowell, Pacific Palisades, Calif., assignor to American Safety Equipment Corporation, Troy, Mich.

Filed Jul. 23, 1985, Ser. No. 758,103
Int. Cl.[4] B60R *22/42*
U.S. Cl. 242—107.2 **11 Claims**

1. In a vehicle having extensible and retractable safety belts on spring-wound, take-up reels to restrain the occupants therein during an emergency condition of the type which includes means mounted in said vehicle for clamping said belts against further extension by the operation of an actuator means against said clamping means in response to the movement of an inertially-activated pawl, an improved said actuator means, comprising:

means for releasably-pinching said belt in response to said movement of said pawl, means for mounting said pinching means for movement with respect to said clamping means

in response to said extensive movement of said belt when said pinching means is activated such that said pinching means is urged against said clamping means to clamp said belt against further extensive movement.



4,624,423
TAPE CASSETTE WITH LINER

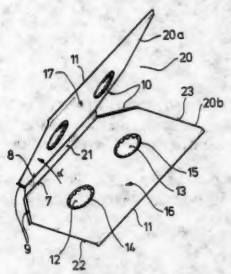
Klaus Schoettle, Heidelberg; Roland Sold, Mutterstadt; Uwe Brinkmann, Kehl, and Werner Wagner, Oberkirch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 15, 1985, Ser. No. 734,181

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 8415333[U]

Int. Cl.⁴ G11B *23/04, 23/08*

U.S. Cl. 242—199 **15 Claims**



1. A magnetic tape cassette, in particular a compact cassette, comprising a housing having upper and lower walls, at least one roll of magnetic tape within the housing onto which the magnetic tape can be wound or from which the magnetic tape can be unwound, a first liner part arranged between said at least one roll of magnetic tape and said upper wall of the housing and a second liner part arranged between said at least one roll of magnetic tape and said lower wall of the housing, the said first and second liner parts being connected together, wherein the liner parts are connected to one another along adjacent peripheral edges, and wherein each liner part is provided with bearing means which support each liner part against its associated upper or lower wall of the housing so that a cushion form is produced on each side of said at least one roll of magnetic tape.

10. For use in a magnetic tape cassette, in particular a compact cassette, of the type comprising a housing having upper and lower walls, and within the housing at least one roll of magnetic tape onto which the magnetic tape can be wound or from which the magnetic tape can be unwound,

a support liner having a first liner part for insertion between said at least one roll of magnetic tape and said upper wall of the housing, and a second liner part for insertion between said at least one roll of magnetic tape and said lower wall of the housing, said first and second liner parts being connected to each other along adjacent peripheral edges and each liner part being provided with bearing means for supporting the liner part against the associated upper or lower housing wall so that a cushion form is provided on each side of said at least one roll of magnetic tape.

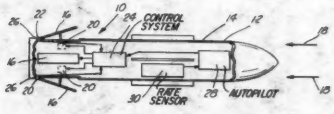
4,624,424
ON-BOARD FLIGHT CONTROL DRAG ACTUATOR SYSTEM

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 7, 1984, Ser. No. 669,212

Int. Cl.⁴ F42B *15/02, 25/24*

U.S. Cl. 244—3.21 **3 Claims**



1. An on-board flight pitch, yaw and roll control drag actuator system for controlling the flight of a missile, the system comprising:

a plurality of control panels hinged on the missile;

an actuator connected to each pannel for opening and closing the panels into the airstream of the missile, the actuator connected to the panel using a two-way actuator drive with a gas operated piston mounted therein, the piston having an actutor rod extending outwardly therefrom, the end of the actuator rod connected to a slide lever attached to a hinged joint mounted at one end of the control panel, the two-way actuator drive, when actuated by compressed gas, moving the actuator rod which in turn rotates the slide lever and hinged joint thereby raising the control panel into the airstream and lowering the control panel into a closed position;

a feedback position measuring device connected to the panels for monitoring the position of the panels; and

an autopilot control system connected to each actuator and feedback position measuring device and programmed for determining the required position of the control panels.

4,624,425
FIXED WING LIGHT AIRCRAFT

Michael Austin, 575 Madison Ave., Suite 1006, New York, N.Y. 10022, and B. Lyle Schofield, Lancaster, Calif., assignors to Michael Austin, New York, N.Y.

Filed May 23, 1984, Ser. No. 613,862

Int. Cl.⁴ B64C *1/16, 9/12*

U.S. Cl. 244—13 **22 Claims**

1. A fixed wing powered light aircraft characterized by:

a fuselage including two elongated spaced apart tubular booms extending from a forward end of said fuselage to an aft end and interconnected by spaced apart laterally extending brace members;

a pylon structure secured to said booms and constructed for supporting a propulsion engine and propellar means drivenly connected to said propulsion engine, said pylon structure comprising a tubular frame and including engine mount means secured to said frame for supporting said engine;

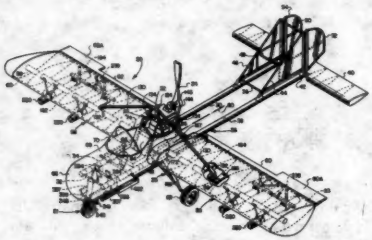
a cockpit disposed forward of said pylon structure including a pilot seat;

horizontal and vertical stabilizer means supported on said fuselage at said aft end;

a streamlined cockpit enclosure including a nose cowl portion and opposed fuselage side panels extending to a point rearward of said pylon structure and including respective curved portions formed to minimize airflow turbulence approaching said stabilizer means;

opposed wing sections connected to said fuselage adjacent to and on opposite sides of said cockpit; and

at least one missile support and launch tube supported on each of said wing sections by respective support means, said support means comprising a forward tube support bracket extending from and supported by a frame member of said wing section, and a rear tube support bracket extending from and supported by a frame member of said wing section, and means for adjusting said rear support bracket for aiming said missile tube at a target point forward of said aircraft, said means for adjusting said rear



support bracket including means for adjusting the elevation of the longitudinal axis of said missile tube and means for adjusting the lateral bearing of said missile tube, and at least a second missile support and launch tube supported on said wing section and spaced from said first tube, and support means for said second tube including a forward tube support bracket for said second tube extending from and supported by a frame member of said wing section, and a rear support bracket for said second missile tube extending from and supported by a frame member of said wing section, and means for adjusting said rear support bracket for said second missile tube relative to said wing section and said first missile tube for aiming said second missile tube at said target point forward of said aircraft, wherein said rear support brackets include an elongated beam and at least two support links pivotally connected to said beam and to means secured to said frame member of said wing section, means for adjusting the length of said beam, and means for adjusting the length of each of said links, whereby each of said missile tubes can be aimed at a selected target point forward of said aircraft.

4,624,426

FUEL DUMP MECHANISM FOR AIRCRAFT

Ralph P. Muscatell, 2007 NE. 20th Ave., Fort Lauderdale, Fla. 33305

Filed Jul. 30, 1984, Ser. No. 635,802
Int. Cl.[4] B64D *37/26, 1/16*
U.S. Cl. 244—135 R **11 Claims**

1. A fuel dumping valve for fast evacuation of a fuel tank for an aircraft comprising:

a valve head disposed in the underside of a fuel tank, the valve head having an open position for releasing fuel from the tank, and a closed position;

at least one generally vertical valve stem attachted to said valve;

a valve seat matching the valve head for receiving the valve head in the closed position;

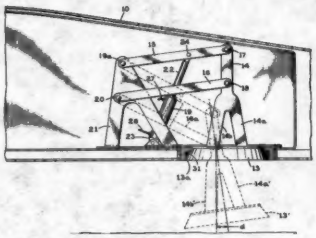
means for guiding said valve head between said open and said closed positions;

actuating means for moving said valve head between said open and said closed position; and

sealing means for sealing said valve head in its closed position;

at least one generally vertical frame member rigidly attached to the inside bottom of said fuel tank and projecting upward therefrom;

at least one pair of generally parallel levers each pivotally



attached, spaced apart a first distance one above the other at one end to said frame member, and spaced apart a second distance at the other end pivotally attached to said valve stem; and

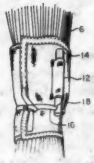
wherein said first distance is greater than said second distance thereby causing said valve head to assume a tilted position when extended, said tilt defined as a small angle α between said valve stem and the plane perpendicular to the plane defined by the valve seat such that said valve head is sloping downward and forward when extended for catching the flow of air under said wing.

4,624,427

PARACHUTE CANOPY REEFING TECHNIQUE

John E. Atzrott, Natick, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 16, 1985, Ser. No. 808,963
Int. Cl.[4] B64D *17/36*
U.S. Cl. 244—152 **5 Claims**



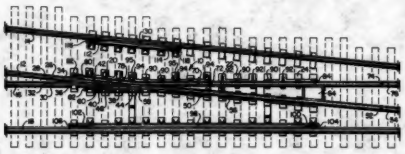
1. A parachute comprising a canopy having a periphery; a series of suspension lines extending from the periphery; a reefing line buffer cloth encircling said suspension lines, a reefing line encircling and holding said reefing line buffer cloth in place and a cutting means to cut said reefing line at a predetermined time during deployment of said canopy; wherein said cutting means is held in place by a pocket on said reefing line buffer cloth.

4,624,428

SPRING RAIL FROG

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, Stamford, Conn.

Filed Sep. 20, 1984, Ser. No. 652,546
Int. Cl.[4] B61L 11/02
U.S. Cl. 246—276 5 Claims



1. A railroad frog assembly adapted to be inserted between a pair of traffic rails and a pair of closure rails which comprises:

a support means having a heel end and a toe end; a long point rail mounted on the heel end of the support means; a short point rail mounted on the heel end of the support means and joined to the long point rail at the angle of frog; a heel block mounted on the support means between the long point rail and the short point rail for maintaining the frog angle and spacing between the long point rail and the short point rail, a rigid wing rail mounted on the toe end of the support means having an angled end and a closure rail engaging end; a flexible spring wing rail mounted at the toe end of the support means having an angled section which is unrestrained laterally and which is movable laterally between a first position in which it engages the long point rail and a second position in which it is spaced from the long point rail to provide a flangeway therebetween, a closure rail engaging end and a remote end adjacent said angled section which terminates in a tip, wherein said tip is unrestrained from lateral movement and is displaced laterally away from the long point rail a first distance when said angled section engages said long point rail and is displaced laterally away from the long point rail a second distance which is greater than said first distance when said angled section is spaced from said long point rail; wherein the long point rail, the rigid wing rail and the spring wing rail cooperate to define the half inch point of frog; and means for rigidly fixing the spring wing rail to the support means at a point between the free end and the closure rail engaging end to prevent lateral and vertical movement of said spring wing rail at said point; wherein said point is spaced from the half inch point of frog that distance which will cause the spring wing rail to bend uniformly along its length from the point of fixation to the half inch point of frog and move laterally from the long point rail to the second position when a lateral force greater than approximately five hundred pounds is applied to the spring wing rail by a rail car wheel flange in the flangeway at the half inch point of frog.

4,624,429

HOSE FIXTURE

Takeshi Miyazaki, Inazawa, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Sep. 28, 1984, Ser. No. 655,625
Claims priority, application Japan, Sep. 29, 1983, 58-183920
Int. Cl.[4] F16L 5/00
U.S. Cl. 248—56 3 Claims

1. A hose holder which is improved so as to be able to be alternatively used with either of the two different types of mounting fixture, namely

(a) a first type of mounting fixture which includes a plate having an opening provided therethrough, this opening having a generally rounded bounding peripheral surface provided with two substantially angularly spaced, angularly short segments of substantially different radial extent than that of the remainder of said generally rounded peripheral surface, this plate being generally planar, but being bulged in one direction about an axis which extends generally parallel to a face of the plate in such a manner that both of said two substantially angularly spaced, angularly short segments of said peripheral surface of said opening are substantially axially displaced from the plane of the remainder of said plate, and

(b) a second type of mounting fixture, which is like the first, but for omission of said bulge, so that said plate is substantially planar with both of said two substantially angularly spaced, angularly short segments of said peripheral surface of said opening and the remainder of said peripheral surface of said opening are disposed in common plane,

said hose holder comprising:

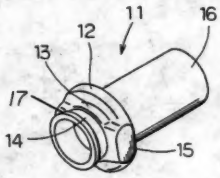
a tubular member adapted to be mounted to a hose in surrounding relation to an axially short region of the hose, in order to permit the hose, at that region, to be mounted to another structure;

a first radially outwardly projecting flange fixed on said tubular member;

a second radially outwardly projecting flange fixed on said tubular member axially adjacent said first flange; and

a third radially outwardly projecting flange fixed on said tubular member with axial spacing from said second flange so as to define between said second and third flanges a radially outwardly opening groove adapted to receive a spring clip;

said first and second radially outwardly projecting flanges both being defined in part by respective generally rounded



radially outer peripheral surfaces, but each of these two radially outer peripheral surfaces including in common at two substantially angularly spaced sites respective angularly short segments of substantially different radial extent than that of the remainder of the respective two outer peripheral surfaces;

said first and second flanges, including said two angularly short segments thereof being sized and shaped to alternatively coact with said first and second mounting fixtures, as follows:

if the tubular member is inserted third flange first into a said opening of a said first type of mounting fixture, angularly aligned and axially advanced until portions of the first flange abut a respective one face of said first type of mounting fixture marginally of said opening,

(a) portions of said second flange within the plane of said remainder of said plate of said first type of mounting fixture are radially closely surrounded by respective portions of said peripheral surface of said opening;

(b) said two angularly short segments of said first flange are radially closely surrounded by respective of said two angularly short segments of said peripheral surface of said opening in said bulge so as to prevent angular rotation of said hose holder relative to said first type mounting fixture; and

(c) said radially outwardly opening groove is positioned to receive a spring clip to act between said third flange and the respective opposite face of said plate of said first type of mounting fixture for preventing substantial

relative axial movement between said hose holder and said first type of mounting fixture, but

if the tubular member is inserted third flange first into a said opening of a said second type of mounting fixture, angularly aligned and axially advanced until portions of the first flange about a respective one face of said second type of mounting fixture marginally of said opening:

(a) said second flange, including said angularly short segments thereof, is radially closely surrounded by said peripheral surface of said opening, including said angularly short segment thereof so as to prevent angular rotation of said hose holder relative to said second type of mounting fixture; and

(b) said radially outwardly opening groove is positioned to receive a spring clip to act between said third flange and the respective opposite face of said plate of said second type of mounting fixture for preventing substantial relative axial movement between said hose holder and said second type of mounting fixture.

4,624,430

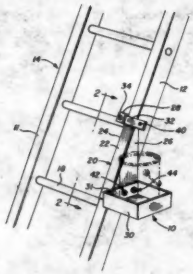
LADDER CADDY

Richard D. Ehmke, 5104 Van Buren Rd., Dunkirk, N.Y. 14048

Filed Jun. 7, 1985, Ser. No. 742,696

Int. Cl.[4] E06C *7/14*

U.S. Cl. 248—211 **6 Claims**



1. A caddy attachment for a stepladder comprising a channel section rail adapted to fit over an upright of the ladder, the rail having inner and outer webs connected by a flange, a support member on the outer web of the rail, and the inner web of the rail having a lower edge portion for engaging the top of a first ladder rung to support the attachment, wherein the rail has a hook member at its upper end inside of said inner web for engagement over a second rung of the ladder above the first rung, wherein the hook member is secured to a projecting bar mounted on the flange of the rail, wherein the bar projects on both sides of the rail, the hook member being releasably attachable to the bar selectively at the respective ends thereof, and the support member being releasably attachable to each of the webs of the rail whereby the attachment can be selectively assembled for use on each of the uprights of the ladder.

4,624,431

LOCKING CLIP FOR BAR BRACKET

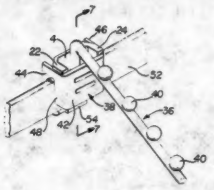
William Pfeifer, Springdale, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1985, Ser. No. 783,310

Int. Cl.[4] E04G *5/06*

U.S. Cl. 248—215 **18 Claims**

1. A novel clip adapted for mounting a hanger arm to a crossbar comprising a vertical wall, a substantially horizontal lip integral therewith at the base thereof extending forwardly therefrom, a pair of walls integral with said vertical wall extending forwardly therefrom along the vertical edges thereof and downwardly from adjacent the top edge thereof, said pair of walls being shorter in length that the length of said vertical wall, said pair of walls being provided with a first pair of substantially horizontal stop members integral therewith and



extending laterally therefrom, said pair of walls being further provided with a second pair of substantially horizontal stop members integral therewith and extending laterally therefrom adjacent the upper end thereof.

4,624,432

HEAVY DUTY CLAMPING SYSTEM

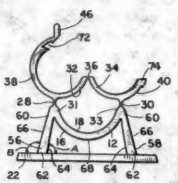
Frank Salacuse, New York, N.Y., assignor to Super Glue Corporation, Hollis, N.Y.

Continuation of Ser. No. 508,964, Jun. 29, 1983, abandoned.

This application Dec. 6, 1984, Ser. No. 678,614

Int. Cl.[4] F16L *3/08*

U.S. Cl. 248—316.5 **10 Claims**



1. An improved multi-purpose holding system of the type of holding system having interconnected control levers capable of being moved by snapping between open and closed modes when relatively heavy loads are contemplated for the system, in combination, comprising:

a body produced from one piece of plastic, said body including,

a resilient spring member having two end portions and two film hinges, each of said two film hinges being connected to one of said end portions, said spring member having opposed open and closed sides,

two interconnected control levers, each of said control levers being connected to one of said two film hinges and disposed on said open side of said spring member, said two control levers including a middle film hinge interconnecting said two control levers,

at least one gripping member connected at one of said end portions to one of said two control levers, said one gripping member and said two control levers being movable between an open position and a closed position, wherein in said closed position said gripping member is detachably connected at the other of said end portions of said two control levers to the other of said control levers, said one gripping member, said one control lever and said other control lever forming a gripping cavity for holding an object, and in said open position said at least one gripping member being spaced from said other of said end portions control lever,

said spring member being movable between an unbiased spring position and a biased spring position, wherein when said one gripping member with two control levers are in either said open or closed positions, said spring member is

in said unbiased spring position wherein said end portions are spaced apart at a first distance; and wherein when said said one gripping member and said two control levers are being moved between said open and closed positions, said spring member is in said biased spring position wherein said end portions are spaced apart at a second distance greater than said first distance,

two resilient mounting members having opposed connecting ends and base ends, said connecting ends being secured to said end portions of said spring member, said two mounting members being movable between unbiased and biased mounting positions, wherein when said one gripping member and said two control levers are in either said open or closed positions and said spring member is in said unbiased mode, said two mounting members are in said unbiased mounting position wherein said connecting ends are spaced apart at a first length; and wherein when said one gripping member and said two control levers are being moved between said open and closed positions and said spring member is in said biased mode, said two mounting members are in said biased mounting position wherein said connecting ends are spaced apart at a second length greater than said first length, and

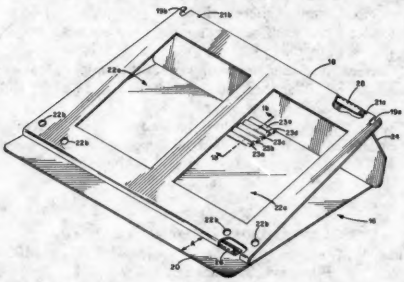
a substantially flat base connected to said base ends of said mounting members, said base being disposed on said closed side of said spring member, wherein the sum of the distances between said middle film-hinge and said two film-hinges is greater than the distance between said two film-hinges, and wherein in said closed position said two control levers fit into said open side of said spring member so that the sum of the distance between said middle film-hinge and said two film-hinges is only a little less than the uncoiled length of said resilient spring member.

4,624,433

TILT BASE FOR A CRT DISPLAY TERMINAL

Helmut H. Henneberg, Canton, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 13, 1983, Ser. No. 531,803
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—346 **42 Claims**



1. A wedge-shaped tilt base assembly for use with a CRT display terminal unit for providing a wide range of operator viewing angles, said assembly comprising:

top plate means having front and rear edges defining a shape which conforms to the shape of the bottom of said unit;

base plate means having front and rear edges which define a shape similar to said shape of said top plate means; and,

stabilizing flap means having a predetermined shape; one end of said top plate means being pivotally mounted to said base plate at a predetermined position away from said front edge of said base plate means for stabilizing said terminal unit and to form top and bottom portions of said wedged-shaped assembly and the other end of said top plate means being pivotally mounted to one end of said flap means which forms a rear portion of said wedge-shaped assembly, the other end of said flap means being allowed to swing free as said top plate means is rotated through said viewing angles;

said top plate means including at least a pair of open ended slots, one at each corner at said rear edge of said top plate for the attachment of said assembly to said terminal unit; and

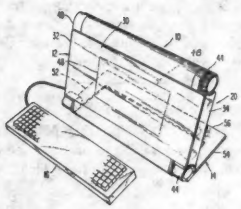
said base plate means including a series of stops corresponding to a series of louvers, each of said louver having a front to rear slope to enable rearward sliding of said free end of said flap means to be slid securely into position by an operator without separately lifting said terminal unit during the rotation of said top plate means to provide a corresponding number of different viewing angles for said terminal unit.

4,624,434

STABLE TILTABLE DISPLAY TERMINAL

Ralph J. Lake, Jr., Somerville, and George A. Sudol, Mine Hill, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1984, Ser. No. 683,578
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—454 **11 Claims**



11. Tilt control apparatus comprising:

a U-shaped base member having two legs,

a tiltable member coupled to said base member,

said tiltable member including a frame carrying a display panel,

said frame having left and right parallel edges, the lower ends of said edges having laterally projecting hollow tubular members,

a torsion spring disposed within each of said tubular members,

a frictional sleeve enclosing each tubular member, and

a split, tubular bracket enclosing each sleeve and its tubular member, the closure of each split bracket being adjusted to set the desired frictional engagement between each split bracket and the associated frictional sleeve,

each tubular bracket being secured to one leg of said base member,

one end of each spring engaging its tubular member and the opposite end engaging the associated tubular bracket so that, as said tiltable member is pivoted with respect to said base member by rotation of each tubular member within its tubular bracket, each spring winds up and generates a torque which opposes the pivoting of said tiltable member and permits the tiltable member to hold any desired angular position with respect to said base member.

4,624,435

ELECTRO-MAGNETIC VIBRATION-DAMPING MOUNT

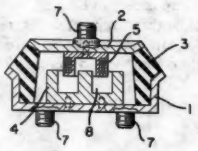
Tillmann Freudenberg, Finkenweg 3, 6108 Weiterstadt, Fed. Rep. of Germany

Filed Apr. 20, 1984, Ser. No. 602,299

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314335

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—550 9 Claims



1. An electro-magnetic vibration-damping mount, comprising:

a bracket and pedestal for, in use, respective connection to and, thereby, vibration with relatively-vibrating structures;

resilient means connecting the bracket and pedestal for resiliently isolating the vibrations therebetween in at least one direction;

damping means for damping the vibrations between the bracket and pedestal in the one direction, the damping means comprising a magnet operatively connected to one of the bracket and pedestal and an induction coil operatively connected to the other for electro-magnetic interaction with the magnet in response to the vibrations between the bracket and pedestal in the one direction; and

electro-magnetic control means for controlling the damping means comprising a variable resistor electrically connected across the induction coil.

4,624,436

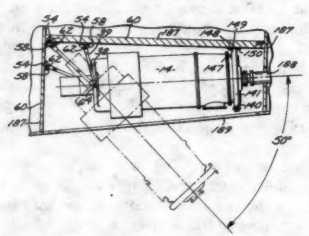
AIRCRAFT ENGINE MOUNT

Daniel E. Cooney, Sparks, Nev., and Russell D. Miller, Melbourne Beach, Fla., assignors to Lear Fan Corp. (U.S.), Reno, Nev.

Filed Feb. 5, 1981, Ser. No. 231,667

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—555 20 Claims



1. An apparatus for mounting an aircraft engine to an airframe, comprising:

means for connecting the engine to the airframe, the connecting means adapted to permit pivotal movement of the engine from a first position to a second position;

means attached to the engine for selectively maintaining the engine in the first position;

the connecting means including:

a mount, the mount being pivotably attached to a first portion of the engine, the mount operative to maintain the first position of the engine substantially proximate to the airframe when the engine is in the first or the second position, the mount further adapted to permit a second portion if the engine to be pivoted through a defined angle to place the engine in the second position;

strut means operative with the mount to support the engine for atriculated movement from the first position to the second position.

4,624,437

BODY-WEIGHT ADJUSTING DEVICE OF A SEAT SUSPENSION

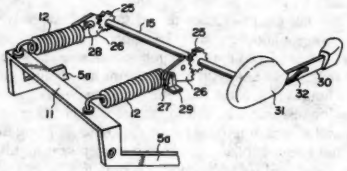
Takao Sakamoto, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd., Japan

Filed Jan. 4, 1985, Ser. No. 688,918

The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—564 5 Claims



1. A body-weight adjusting device for a seat suspension which comprises:

(a) a pair of X-shaped links constituting said seat suspension;

(b) a rotary shaft extending in a transverse direction of said pair of X-shaped links;

(c) an operation lever connected to one end of said rotary shaft in such manner that it is disposed in a direction substantially perpendicularly to the axis of said rotary shaft;

(d) at least one pinion gear fixed on said rotary shaft for integral rotation therewith;

(e) at least one rack gear, rotatably fixed to mesh with said pinion gear;

(f) at least one tension spring operatively connected at one end to said X-shaped links and latched at the other end to said at least one rack gear

whereby said rotary shaft rotated by operation of said operation lever drives said rack gear and, consequently, said tension spring, to adjust said X-shaped links.

4,624,438

ADJUSTABLE OUTBOARD TRANSOM

Charles W. Goodman, Jr., P.O. Box 418, Benton, La. 71006

Filed Apr. 5, 1985, Ser. No. 720,294

Int. Cl.[4] F16M *1/02*

U.S. Cl. 248—642 5 Claims

1. An adjustable outboard transom for mounting on a boat transom and adjustably raising and lowering an outboard motor, comprising:

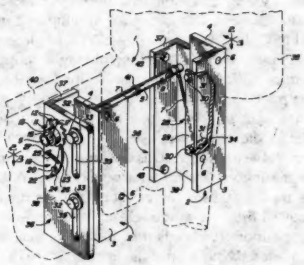
(a) a first generally L-shaped fixed bracket having a first slotted flange projecting from the boat transom and a first transom flange fixedly secured to the boat transom and a second generally L-shaped fixed bracket having a second slotted flange projecting from the boat transom and a second transom flange fixedly secured to the boat transom in spaced relationship with respect to said first transom flange;

(b) at least one first slot provided longitudinally in said first slotted flange and at least one second slot provided longitudinally in said second slotted flange;

(c) a first generally L-shaped motor mount bracket having a first lift flange slidably disposed adjacent said first slotted flange and a first motor mount flange extending in essentially parallel relationship with respect to the boat transom and a second generally L-shaped motor mount bracket having a second lift flange slidably disposed adjacent said second slotted flange and a second motor mount flange extending in essentially parallel relationship with respect to the boat transom;

(d) first cable mount means carried by said first lift flange and slidably cooperating with said at least one first slot and second cable mount means carried by said second lift flange and slidably cooperating with said at least one second slot;

(e) a cable shaft rotatably carried by said first slotted flange and said second slotted flange;



(f) a pair of cable pins projecting transversely from said cable shaft in spaced relationship; and

(g) a flexible cable at least partially wound on said cable shaft between said cable pins and the ends of said cable shaft, respectively, with said flexible cable engaging said cable pins and a segment of said flexible cable extending between said cable pins and one end of said flexible cable fixedly attached to said first cable mount means and the opposite end of said cable fixedly attached to said second cable mount means whereby said first motor mount bracket and said second motor mount bracket are selectively raised and lowered in concert with respect to said first fixed bracket and said second fixed bracket when said cable shaft is rotated and said flexible cable is selectively wound and unwound on said cable shaft.

4,624,439

APPARATUS FOR MANUFACTURING CONCRETE POSTS

Enoc C. Aguilera, 1990 Wainwright Rd., Stevinson, Calif. 95374

Continuation-in-part of Ser. No. 213,741, Dec. 5, 1981, abandoned. This application Mar. 12, 1982, Ser. No. 357,649

Int. Cl.[4] B28B 7/04

U.S. Cl. 249—48 **12 Claims**

10. A mold in which to cast cementitious posts, said mold including a base having first, second and third adjoining marginal portions extending about said base, a first stationary upstanding wall fixedly secured to and upstanding from one of said marginal portions, second and third upstanding walls, pivot means pivotally supporting said second and third walls along base upstanding marginal edges thereof from remote marginal edges of said stationary wall for swinging movement of second free standing marginal edges of said second and third walls remote from said first edges toward and away from closely juxtaposed positions, said first, second and third upstanding walls, when said second marginal edges are closely juxtaposed, defining a peripherally enclosed upstanding mold cavity above said base with the lower marginal edge portions of said second and third walls overlying and disposed in reasonably good sealed relation with said second and third marginal portions, said first stationary upstanding wall being generally planar and including a first mold defining front side outwardly from which said first base upstanding marginal edges of said second and third upstanding wall project when said free upstanding edges of said second and third upstanding walls are disposed closely juxtaposed, said pivot means defining pivot axes for said second and third upstanding walls spaced to the rear of said front side and oppositely outwardly from said remote marginal edge of said first stationary upstanding wall, said pivot means also including means operative to enable vertical shifting of said second and third walls relative to said stationary wall and base, the weight of said second and third walls serving downwardly bias said second and third walls with the lower edges thereof tightly frictionally engaged with the upper surfaces of said base defining said second and third marginal portions to thereby effectively increase the fluid seal between said base and the lower ends of said second and third walls.

4,624,440

ADJUSTABLE FORMWORK FOR CONCRETE STRUCTURES

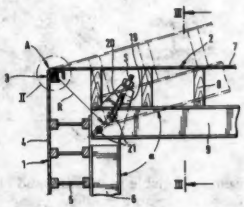
Wilhelm Büchler, Haar, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,614

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409452

Int. Cl.[4] E04G 9/08

U.S. Cl. 249—194 **6 Claims**



1. Adjustable formwork for forming corner surfaces of concrete structural members comprising a first formwork unit and a separate second formwork unit each arranged to extend generally parallel to the surface of the concrete structural member being formed and to extend angularly relative to one

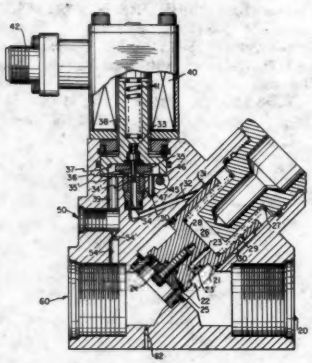
another, said first and second formwork units including surfaces to form the corner surfaces of the concrete structural members being formed, said first and second formwork units being connected whereby said units can be adjustably displaced and fixed relative to one another, wherein the improvement comprises that said surfaces of said first and second formwork units form a corner junction line approximately defining the apex of the angle between the surfaces of the concrete structural members being formed, and said corner junction line forms a pivot axis for pivotally adjusting said formwork units re...tive to one another, one of said first and second formwork units having a circular arc-shaped guide slot therein with the circular arc being centered on the corner junction line, two guide pins disposed in spaced parallel relation and secured to the other one of said first and second formwork units and extending through and being movably guided within and along said circular arc-shaped guide slot affording a link guidance for the pivotal movement of said first and second formwork units relative to one another, an adjustment element is secured to the one of said first and second formwork units and is secured to one of said guide pins within said guide slot in the other one of said first and second formwork units so that said first and second framework units can be pivotally adjusted relative to one another whereby the angle between said surfaces forming the corner surfaces can be selectively increased or decreased relative to the angle formed by said surfaces in position to form the corner surfaces of the concrete member, said adjustment element comprises a spindle secured to the one of said first and second formwork units containing said guide slot with said spindle extending approximately tangentially of said guide slot, said spindle comprises a threaded bolt secured to said one guide pin with a nut mounted on said threaded bolt and arranged for axially displacing said threaded bolt as said nut is rotated thereon.

4,624,441

INFLATION VALVE

Morton A. Kreitchman, South Orange, and Kurt Arnold, West Caldwell, both of N.J., assignors to Valcor Engineering Corporation, Springfield, N.J.

Filed Sep. 13, 1982, Ser. No. 417,069
Int. Cl.[4] F16K *31/42, 31/11*
U.S. Cl. 251—30.01 **12 Claims**



1. A valve assembly capable of opening and closing to control the flow of a fluid pressure medium, comprising:
an inlet port for receiving the fluid medium and an outlet port connected to the inlet port and discharging the fluid medium when the valve assembly is open;
a main valve seat located between said inlet port and said outlet port;
a main valve poppet normally urged against said main valve seat to close it, due, at least in part, to the pressure in a pressure volume derived from the fluid medium at the inlet port;
a cross over opening extending to the exterior of the valve assembly and coupled to said outlet port through a first restricted orifice;
a conduit leading from the pressure volume to the cross over opening;
a pilot valve located in said conduit, said pilot valve including a pilot valve seat and a pilot valve pin seal located down stream of said pilot valve seat, said pin seal being urged against said pilot valve seat to close said pilot valve;
means for moving said pilot valve pin seal away from said pilot valve seat to open said pilot valve so that the pressure in the pressure volume is reduced sufficiently to permit said main valve poppet to move away from said main valve seat due to the passage of fluid medium to said cross over opening and said outlet port, and the pressurization thereof, said means for moving said pilot valve pin seal including a plunger in which said pilot valve pin seal is retained and said plunger having a sensing surface in contact with the fluid pressure medium passed through said pilot seat; and
orifice means for controlling the flow of medium from the inlet to the cross over opening and outlet port when the pilot valve is opened so as to maintain a certain pressure at the sensing surface for a particular range of inlet pressure, the area of said sensing surface being such that the certain range of pressure at the sensing surface holds the plunger in a position that keeps the pilot valve pin seal away from the pilot valve seat until the inlet pressure drops below the particular range.

4,624,442

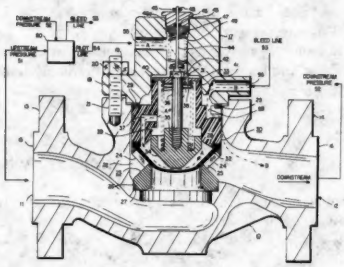
CONTROL REGULATOR HAVING A ROLLING DIAPHRAGM

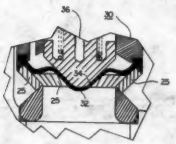
John W. Duffy, 1512 McClellan St., Tama, Iowa 52339; William J. Bonzer, R.R. #3-Box 243; Gary L. Scott, 4 Columbus Dr., both of Marshalltown, Iowa 50158; Dennis G. Sickels, 2204 S. 5th Ave., and Ralph W. Zeigler, 607 N. 16th St., both of Marshalltown, Iowa 50158

Filed Jan. 23, 1985, Ser. No. 694,176
Int. Cl.[4] F16K *31/126*
U.S. Cl. 251—61.1 **9 Claims**

1. A rolling diaphragm regulator valve comprising:
a valve body having an upstream inlet and a downstream outlet;
a control chamber in said valve body;
a frustroconical baffle interposed between said inlet and said outlet and defining a plurality of apertures;
a circular reinforced substantially non-stretchable diaphragm arranged for rolling and unrolling along said apertures responsive to a pilot pressure in said control chamber to progressively expose and cover said apertures and thereby control upstream to downstream flow;
a nose cone mounted for limited movement in an axial direction only toward and away from said baffle, said nose cone being in communication with said control chamber; and

said diaphragm progressively draping over the surface of said nose cone during unrolling from said apertures and





being entirely out of contact with said nose cone when said apertures are fully covered.

4,624,443

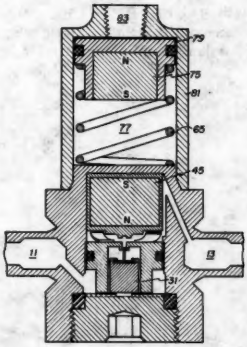
FLUID-FLOW CONTROL VALVE

Paul G. Eidsmore, Scotts Valley, Calif., assignor to Integrated Flow Systems, Inc., Scotts Valley, Calif.

Continuation-in-part of Ser. No. 398,845, Jul. 16, 1982, abandoned. This application Nov. 28, 1984, Ser. No. 675,825

Int. Cl.[4] F16K *31/08*

U.S. Cl. 251—65 **2 Claims**



1. Apparatus for inhibiting the excess flow of fluid under pressure therethrough and for manually restoring flow controlling operation thereof without fluid seals on flexible members interposed between fluid under pressure therewithin and the environment, the apparatus comprising:

a body having an aperture between vertically-aligned lower first chamber and upper second chamber for fluid flow therethrough from the first chamber to the second chamber, said aperture having a sealing face on the side thereof within the first chamber;

a fluid inlet coupled to the first chamber at a location in the lower region thereof remote from the aperture, and a fluid outlet coupled to the second chamber;

an element vertically disposed and slidably positioned within the first chamber intermediate the fluid inlet and the aperture and freely slidable vertically therein for movement between a normally-open reset position away from engagement with the aperture and a sealing position in contact with the aperture to form a fluid-tight seal therewith without any intervening resilient means for urging the element away from the sealing position, said element providing fluid passages of selected cross-sectional area from the fluid inlet to the aperture for imparting self-actuated moving force to the element to move the element to the sealing position in contact with the aperture in response to fluid under pressure flowing through said selected cross-sectional area momentarily in excess of a selected flow rate;

an actuator carried on said element disposed for vertical movement through the aperture for selectively repositioning the element in the first chamber to its reset position therein from the second chamber;

control means including a magnet mounted for vertical sliding movement within the second chamber to selectively engage the actuator;

spring means disposed within the second chamber to urge said control means away from engagement with the actuator to permit fluid under pressure at said fluid inlet to maintain said element in said sealing position in contact with said aperture following momentary excess rate of flow of the fluid under pressure;

a magnet disposed outside the body to interact in direct alignment and in magnetic repulsion with the magnet of the control means for altering the position of the control means within the second chamber to apply force to the actuator.

4,624,444

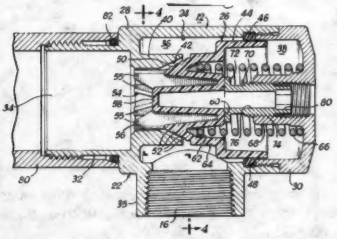
CONTROL STOP FOR FLUSHING SYSTEM

Dwight N. Johnson, Carlsbad, Calif., assignor to Masco Corporation, Taylor, Mich.

Filed Oct. 28, 1985, Ser. No. 791,771

Int. Cl.[4] F16K *47/04, 51/00*

U.S. Cl. 251—121 **8 Claims**



1. A flushing system for a toilet fixture comprising:

a metering flush valve connected to supply liquid to the toilet fixture;

a control stop in series liquid flow relation between a source of pressurized liquid and said metering flush valve;

said control stop including a housing including a body and a cap and having a cavity defined between the body and cap;

a regulator movably mounted in sealed relation in said cavity and defining a control region in said cavity;

an inlet port in said housing in continuous communication

with said control region and connected to the source of pressurized liquid;

an outlet port in said housing connected to the metering flush valve;

a valve seat in said cavity in communication with said outlet port;

said regulator including a skirt portion and a valving portion engagable with said valve seat;

a spring disposed at least partly within said skirt portion and being in compression between said cap and said regulator biasing said regulator toward said valve seat in opposition to liquid pressure in said control region;

means venting to atmosphere the side of said regulator opposite said control region;

a stop member having at least a portion always enclosed with said skirt portion and spaced from said valve seat and engagable by said regulator when said regulator moes away from said valve seat; and

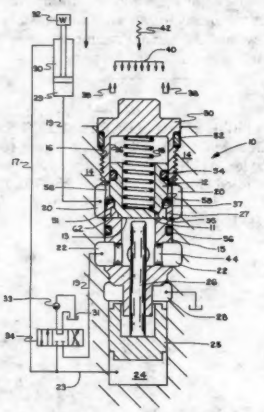
manually operable adjustment means movable independently of said spring for positioning said stop member in a shut-off position in which said regulator valving portion engages said valve seat and alternatively positioning said stop member in one of a range of throttling flow positions in which said valving surface is movable a selected distance from said valve seat.

4,624,445

LOCKOUT VALVE

Richard C. Putnam, Nickerson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Sep. 3, 1985, Ser. No. 771,681
Int. Cl.[4] F15B *13/01, 13/04*
U.S. Cl. 251—63.4 **7 Claims**



1. A self-sustaining lock-out valve which remains open without outside forces as long as sufficient flow is passing across the valve, comprising:

a valve body having a bore which is intersected by an inlet chamber and an outlet chamber;

a poppet positioned in the bore;

a seat positioned in the bore between the inlet and outlet chamber;

spring means urging the poppet into sealing engagement with the seat;

a pin means located in the bore in contact with the poppet for urging the poppet toward an open position;

servo means for actuating the pin means;

an orifice means on the poppet upstream of the seat;

a closing area on the poppet creating a force which urges the poppet closed sensing the pressure downstream of the orifice means;

an opening area on the poppet creating a force which urges the poppet open, the opening area sensing the pressure upstream of the orifice whereby when there is sufficient flow and pressure drop across the orifice, the force on the opening area exceeds the combined closing area force and the spring force so that the lockout remains open when the force on the pin means drops to zero.

4,624,446

GROUND SUPPORTED LEVELER FOR VEHICLE DOCKAGE

Ronald R. Gould, Elk Grove Village, Ill., assignor to Advance Lifts, Inc., St. Charles, Ill.

Filed Jul. 15, 1985, Ser. No. 754,654
Int. Cl.[4] E02C *3/00*
U.S. Cl. 254—88 **16 Claims**

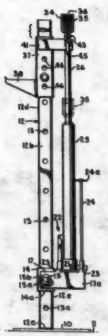
1. A ground supported vehicle lift apparatus comprising a platform means for supporting the wheels of a vehicle, said platform means having first and second opposite ends, a hinge connected between the ground and the second end of the platform, a transverse support beam secured across the platform at the first end thereof, a pair of upright support beams disposed on the sides of the platform at the first end thereof and secured to the transverse support beam, and power cylinder means connected between respective upright members and the ground for raising and lowering the first end of said platform relative to the ground, the entire apparatus being located above ground level.

4,624,447

HYDRAULIC HIGH LIFT JACK

Thomas L. Richmeier, 330 Main St., Grainfield, Kans. 67737

Filed Jan. 14, 1986, Ser. No. 818,701
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—93 H **16 Claims**



1. A variable and high lift jack comprising, in combination:

a normally horizontal base plate receivable on a ground or floor surface,

a normally vertical post fixed at its lower end on said base plate and extending upwardly normal thereto,

said post having a plurality of equally vertically spaced apart, parallel openings therethrough, said openings running vertically a substantial portion of the height thereof,

a base collar slideably mounted on said post and having a set of opposed openings therethrough registrable with each of the post openings for pinning with respect thereto, said collar configured so as to not rotate on said post,

a normally substantially horizontal platform carried by said base collar,

a hydraulic cylinder fixably mounted on said platform and extending vertically upwardly therefrom substantially parallel to said post and spaced away therefrom,

said hydraulic cylinder having a vertically extendable and retractable piston rod associated therewith,

an upwardly arcuate chainway enclosed on both sides thereof fixed to the top of said piston rod and extending substantially parallel to the axes of the openings in said post, the ends of said chainway spaced apart a distance greater than the thickness of said hydraulic cylinder,

a lift slide mounted on said post and vertically moveable thereon, said slide so configured that it will not rotate on said post,

at least one set of opposed openings through the wall of said slide registerable with the openings in said post,

a lift member fixed to said slide on a portion thereof spaced away from said hydraulic cylinder and extending in a direction spaced away from said hydraulic cylinder,

a bifurcated yoke fixed to said slide and extending in a direction substantially toward said hydraulic cylinder,

the two free end portions of said yoke being substantially parallel to one another and extending under the said chainway end portions,

a chain connecting the said yoke free end portions and extending over the chainway, one end of said chain fixedly connected to a first one of said yoke free end portions,

a hook member fixed to the other yoke free end portion engageable with the remaining links in the remaining length of said chain at incremental positions therealong, whereby a short chain linkage between said yoke free end portion connections raises said slide with respect to the upper end of said piston rod and a longer chain linkage between same lowers said slide with respect to said piston rod upper end,

a first pin for removably engaging said collar with said post openings and

a second pin for removably engaging said sleeve with said post openings.

4,624,448

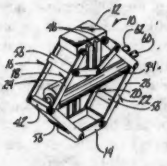
LOW PROFILE, HIGH RISING LIFTING MECHANISM

Dennis J. Lawman, R.R. #2, Box 165, Laurens, Iowa 50554, and Gary G. Greenwood, 311 W. Elm, Pocahontas, Iowa 50574

Filed May 28, 1985, Ser. No. 737,674

Int. Cl.[4] B66F *3/24*

U.S. Cl. 254—122 **14 Claims**



1. A lifting mechanism comprising:

a support plate positioned above a base plate each having corresponding first and second opposite ends and first and second opposite sides;

a first pair of spaced apart hinged arms pivotally connected between said first ends of said support and base plates;

a second pair of spaced apart hinged arms pivotally connected between said second ends of said support and base plates;

connecting means between said first pair of hinged arms and between said second pair of hinged arms;

a stabilizer means having a stabilizer track rigidly secured to said base plate and extending upwardly between said first and second pairs of spaced apart hinged arms, said stabilizer track having a vertical slot through which moves a pin member to which first and second stabilizer arms are pivotally attached and extend outwardly therefrom in generally opposite directions to pivotal attachment to said first and second pairs of spaced apart hinged arms respectively; and

an extensible and retractable power means attached between said connecting means of said first and second pairs of hinged arms to move said connecting means towards or away from each other which causes said first and second pairs of hinged arms to straighten upwardly or fold downardly which raises or lowers said support plate with respect to said base plate.

4,624,449

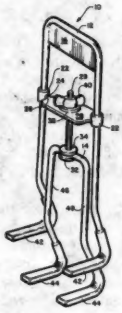
MECHANICAL PULLER

Samuel H. Gentry, 222 E. 8th St., National City, Calif. 92050

Continuation of Ser. No. 622,753, Jun. 20, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 779,607

Int. Cl.[4] B21F *9/00*

U.S. Cl. 254—231 **8 Claims**



1. A mechanical puller comprising:

a generally "U" shaped cylindrical rigid outer frame member having sides with distal tips, a closed end defined by an end member generally perpendicular to the sides, and an open end adjacent said distal tips;

a generally "U" shaped cylindrical rigid inner frame member having sides with distal tips, a closed end and an open end nestable within said outer frame member;

the sides of both of said cylindrical rigid frame members extending in a first direction between said closed and open ends substantially perpendicular to the end member, and in a second direction at their distal outer tips, said second direction being substantially perpendicular to both said first direction and the end member;

a bracket member which is pivotally mounted on and between said sides of said outer frame member adjacent to the closed end of said outer frame member and spaced between the end member and the distal tips for pivotal rotation relative to said sides of said outer frame member; and

an adjustable means interconnecting said inner frame member at its closed end to said pivotal bracket, whereby by adjusting said adjustable means said inner frame member

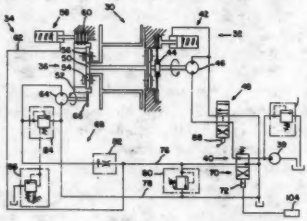
can be vertically relative to said outer frame member whereby the inner frame member can be translated vertically or translated or rotated relative to said outer frame member.

4,624,450

CONSTANT TENSION HOISTING SYSTEM

S. Grant Christison, Bellingham, Wash., assignor to PACCAR Inc., Bellevue, Wash.

Filed Sep. 20, 1984, Ser. No. 653,942
Int. Cl.[4] B66D *1/52, 1/50*
U.S. Cl. 254—273 **18 Claims**



1. An automatically controlled, normal and constant tension hoisting system for raising and lowering an object between a platform and a surface undergoing vertical wave motion relative to the platform, capable of operation in either a normal mode or a constant tension mode, comprising:

a cable;

a drum for reeling in and paying out the cable;

main drive means including a selectively energized and de-energized main motor which is energized for operating the drum when the system is in a normal mode for raising and lowering an object attached to the cable, but is de-energized when in the constant tension mode;

auxiliary drive means including a selectively energized and de-energized auxiliary motor which is energized for operating the drum when the system is in a constant tension mode, but is de-energized when the system is in the normal mode;

final drive means for connecting the main drive means and the auxiliary drive means to the drum; and

mode selection means for automatically switching the system from the normal mode, in which the main motor only is energized, to the constant tension mode, in which the auxiliary motor only is energized.

4,624,451

EQUALIZER CLAMP

John L. Mortoly, Poughkeepsie, N.Y., assignor to James L. Taylor Mfg. Co., Poughkeepsie, N.Y.

Continuation-in-part of Ser. No. 299,341, Sep. 4, 1981, Pat. No. 4,489,925. This application Dec. 19, 1984, Ser. No. 683,370
The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.
Int. Cl.[4] B23Q *1/04*
U.S. Cl. 269—71 **8 Claims**

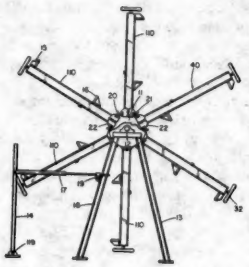
1. A device for holding in position articles to be joined comprising:

(a) a frame including a plurality of horizontal stationary clamp supporting members;

(b) a plurality of clamp members each connected to a coacting pair of clamp supporting members;

(c) each of said clamp members comprises a clamp carrier having a longitudinal axis and jaws thereon between which articles are to be joined and clamped;

(d) a pair of plate members are mounted on opposite sides of said clamp carrier for relative movement between the carrier and plates whereby said carrier is axially moveable in relation to its axis relative to said frame, the pair of plate members engaged to said coacting pair of clamp supporting members by an engaging means, said engaging means capable of disengagement from said supporting members by raising the clamp carrier to enable relative movement



along the supporting members and to enable removal therefrom; and

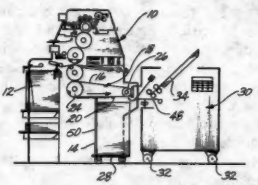
(e) locking means for fixedly positioning the clamp carrier relative to the plate members.

4,624,452

BOARD INSERTER FOR PRINTING PRESS

Nicholas R. Pulskamp, 1616 Bushnell Ave., South Pasadena, Calif. 91030

Filed Aug. 19, 1985, Ser. No. 766,494
Int. Cl.[4] B65H *45/22*
U.S. Cl. 270—95 **6 Claims**



1. Apparatus for inserting paper boards between stacks of paper sheets as the sheets fall individually one at a time onto a stack, comprising:

feeder means for removing and feeding one board at a time from a stack of boards;

means directing each board as it is fed from the stack into the path of said falling sheets;

means synchronizing the feeding of a board by said feeder means with the falling of said papr sheets such that a board is fed between two successive falling sheets;

said synchronizing means comprising counter means for counting the paper sheets, means activating the feeder means in response to the counter means when a predetermined number of paper sheets have fallen,

retractable restraining means; means moving said restraining means into and out of the path of said falling paper sheets, and means activating the moving means with each cycle of the feeder means to move the restraining means into the path of the falling sheets, whereby the fall of a sheet is momentarily interrupted while a board is fed into the path of the falling sheet;

the restraining means including a pair of spring fingers movable along a path extending upwardly into engagement with a falling sheet adjacent one edge of the sheet.

4,624,453

DOCUMENT COUNTER

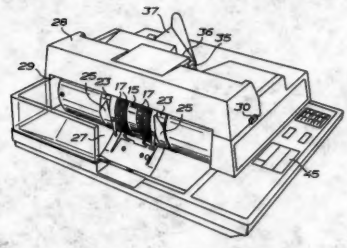
Lennart Svensson, Malmö, Sweden, assignor to Scan Coil AB, Malmö, Sweden

Filed Apr. 3, 1985, Ser. No. 719,421

Claims priority, application Sweden, Apr. 4, 1984, 8401862

Int. Cl.[4] B65H *5/02*

U.S. Cl. 271—4 **7 Claims**



1. Document counter comprising discharge means having a support for a wad of documents, collecting means having a flap wheel system rotating about an axis of rotation, the discharge means and the collecting means being located adjacent each other to form a holder gap positioned substantially on the circumference of the flap wheel system, flaps extending from the periphery of the flap wheel system and forming pockets mutually spaced along the periphery, said pockets opening in a direction which is opposite to the rotational direction of the flap wheel system, a feeder cylinder rotating about an axis of rotation which is located inside the circumference of the flap wheel system, at least one endless conveyor belt passed around the feeder cylinder, means for guiding the conveyor belt in the plane of the support, at least one cam on the feeder cylinder for pressing the conveyor belt into the holder gap and into engagement with the lowermost documents on the support, a receptacle for receiving the documents from the pockets of the flap wheel system, and means for driving said flap wheel system and said conveyor belt, the rotational speed of the flap wheel system being lower than the rotational speed of the conveyor belt.

4,624,454

SHEET FEEDER FOR PRINTING MACHINES

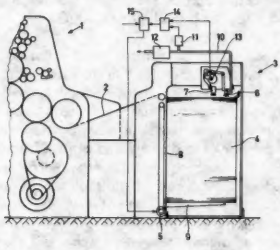
Bertold Grützmacher, Dossenheim, and Karl-Heinz Krestyn, Leimen, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 772,170

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1984, 3432198

Int. Cl.[4] B65H *3/08*

U.S. Cl. 271—30.1 **4 Claims**



1. Sheet feeder of a printing machine having sheet separating and conveying facilities and having a stack table which raises a stack of sheets by means of a controlled lift drive so that a respective uppermost sheet of the stack is in an operating position for the sheet separating and conveying facilities, the sheet separating facility comprising separating suckers for raising, in timed sequence, a respective trailing sheet end, as viewed in sheet conveying direction through the feeder, a suction line connecting said separating suckers to a suction source, pressure measuring means connected in said suction line for determining an actual instant of time at which a respective sheet is sucked up by said separating suckers, means for comparing the actual suction instant of time with a nominal suction instant of time generated in synchronism with rotation of the printing machine to determine a difference value, means for comparing said difference value with a value corresponding to an optimum height of the stack of sheets, and lift drive means for raising the stack of sheets to compensate for a given deviation of said difference value from said optimum height value.

4,624,455

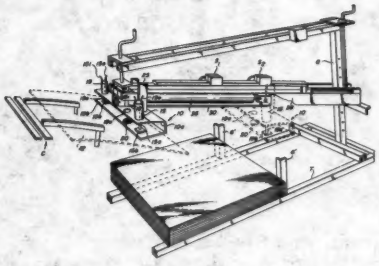
SHEET HANDLING MACHINE

John R. Radek, Hinsdale, and Thaddeus S. Flowers, Chicago, both of Ill., assignors to Ready Metal Manufacturing Company, Chicago, Ill.

Continuation-in-part of Ser. No. 448,352, Dec. 9, 1982, abandoned. This application Jun. 20, 1984, Ser. No. 622,866

Int. Cl.[4] B65H *29/10*

U.S. Cl. 271—85 **3 Claims**



1. An apparatus for stacking thin lightweight sheets having a smoothly finished surface, in an orderly pile, with minimum handling, beyond the outlet end of a conveyor wherefrom the sheets issue by traveling in a forward and downward direction, comprising

(a) a movable channel-shaped sheet receiver for intercepting an individual sheet in its travel beyond the outlet end of the conveyor and guiding it in its continued movement in a forward and downward direction into position overlying the pile wherefrom it may fall freely onto the preceding sheet through an air-cushioned space,

(b) said receiver comprising a web portion at its front end forming an abutment wall with upper and lower walls extending rearwardly therefrom and forming an open end for receiving the advancing edge of the thin sheet issuing from the conveyor,

(c) a reciprocable padded retainer on said receiver incapable of marring or scratching the surface of the sheet adapted to hold the forward edge of the sheet within said receiver in the course of its forward and downward travel,

(d) photoelectric means on said receiver generating a beam of radiant energy between said upper and lower walls subject to interception by a sheet entering said receiver through said open end thereof,

(e) means for moving said retainer into contact with said sheet, means including a downwardly inclined supporting bar for said movable receiver for guiding said receiver in said forward and downward direction, and means for

actuating said receiver in said forward and downward direction in response to the interception of said beam,

(f) means releasing said retainer from contact with said sheet at the end of a predetermined extent of travel of the receiver above the front edge of the pile,

(g) means for continuing slightly the travel of the receiver beyond said front edge of the pile to permit the front edge of the individual sheet to drop from the open end of the receiver when it is clear of the support afforded by the lower wall thereof, to fall freely onto the preceding sheet, and

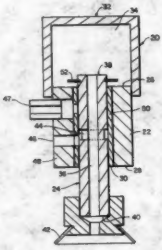
(h) said means for actuating said receiver adapted to move it in the reverse direction to place it in position to receive the next sheet for stacking onto the pile.

4,624,456

APPARATUS FOR ACTUATING A SUCTION WORKHOLDER

Thomas M. Porat, Weare, N.H., assignor to Crathern Engineering Co., Inc., Contoocook, N.H.

Filed Sep. 26, 1985, Ser. No. 780,623
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—103 **6 Claims**



1. An apparatus for pneumatically holding and permitting removal of a workpiece, said apparatus comprising:

a cylinder having a hollow interior between opposite ends of said cylinder;

means for defining a vacuum plenum at one of said ends of said cylinder, said plenum being in pneumatic communication with the interior of said cylinder;

a first port opening through the wall of said cylinder in pneumatic communication with said interior of said cylinder for connecting said interior to ambient pressure;

a second port opening through the wall of said cylinder in pneumatic communication with the interior of said cylinder for pneumatically connecting said interior with a vacuum source; and

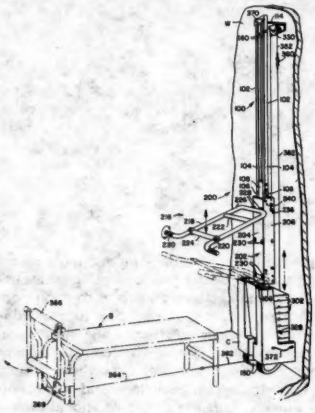
holder means for holding said workpiece with a vacuum, said holder means including a piston, said piston including means for defining a conduit through said piston and an aperture disposed through said piston in pneumatic communication with said conduit, said piston being slidably mounted in the interior of said cylinder for movement between at least a first position wherein said first port is pneumatically closed and said second port, piston aperture, conduit and vacuum plenum are all in penumatic communication so that a vacuum can be applied to said workpiece so as to hold said workpiece, and a second position wherein said second port is pneumatically closed and said first port, piston aperture, conduit and vacuum plenum are all in pneumatic communication so that ambient pressure can be applied to said workpiece so as to permit removal of said workpiece.

4,624,457

PORTABLE WALL MOUNTED EXERCISE UNIT

Ira J. Silberman, Opelika, and William J. Hill, Lanett, both of Ala., assignors to Diversified Products Corporation, Opelika, Ala.

Continuation-in-part of Ser. No. 231,327, Feb. 4, 1981, abandoned. This application Jun. 4, 1981, Ser. No. 270,334
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **12 Claims**



1. In a floor-supported exercise unit adapted to be detachably secured to a wall during use, having floor-engaging support means for supporting the unit, at least one liftable weight, upright guide means for guiding said weight during lifting, and lifting means engageable by a user and operatively connected to said weight for raising and lowering said weight, the improvement comprising lower anchor means, including two mating anchor portions respectively attached to the lower portion of the unit and to a wall, for anchoring the lower portion of the unit to the wall by pivotal movement of the floor-supported unit about said support means upwardly from a slanted position with the lower portion of the unit adjacent the wall and the anchor portions disengaged, to an upright position of use with the anchor portions engaged, and for detaching the lower portion of the unit from the wall by reverse pivotal movement of the unit downwardly from its upright position to disengage said anchor portions.

4,624,458

SELF-ADJUSTING FOOT HOLDING STRUCTURE FOR A TILTABLE BODY EXERCISER

Steven I. Fendrik, 2024 North Sycamore Ave., Los Angeles, Calif. 90068

Filed Jan. 5, 1984, Ser. No. 568,352
Int. Cl.[4] A63B *17/00*
U.S. Cl. 272—145 **7 Claims**

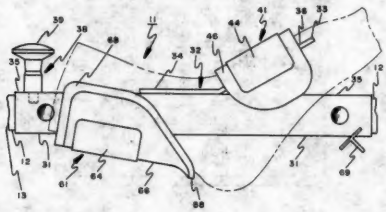
1. In a therapeutic device for the human body in which a main frame pivotally mounts a body supporting structure for longitudinally tilting movement about a horizontal axis, said body supporting structure having an elongated central frame member, an upper body supporting portion attached to the upper end portion of said elongated central frame member, and a lower body supporting portion adapted for secure engagement with the lower end portion of said elongated central frame member, the improvement wherein said lower body supporting portion comprises:

(a) a carriage member mounted upon and supported by the lower end portion of said elongated central frame member, said carriage member having a top surface, an upper end portion, a central portion, and a lower end portion,

said carriage member being slidably positionable along the lower end portion of said elongated central frame member;

(b) an upwardly extending support section situated upon the top surface and attached to the central portion of said carriage member, said upwardly extending support section being inclined with respect to the top surface of said carriage member by an acute angle opening toward the lower portion of said carriage member;

(c) a first transverse member having a central portion slidably mounted upon said upwardly extending support section, said first transverse member having a left end portion extending laterally from said upwardly extending support section and a right end portion extending laterally from said upwardly extending support section, said first transverse member being slidable between first and second limits of travel upon said upwardly extending support section in a plane inclined with respect to the top surface of said carriage member by said acute angle;



(d) left and right inverted U-shaped members attached, respectively, to the left and right end portions of said first transverse member;

(e) a second transverse member having a central portion securely attached to the upper end portion of said carriage member, said second transverse member having a left end portion extending laterally from said carriage member and a right end portion extending laterally from said carriage member; and

(f) left and right U-shaped members attached, respectively, to the left and right end portions of said second transverse member, the inner surface of said attached left and right U-shaped members being adapted for embracing and supporting, respectively, the rear area of the left and right legs of the human body between the ankle and the calf; the inner surface of said left and right inverted, U-shaped members, attached, respectively, to the left and right ends of said first slidably mounted transverse member, being adapted for embracing and supporting the top portions of the left and right feet, respectively.

4,624,459

GAMING DEVICE HAVING RANDOM MULTIPLE PAYOUTS

Clarence D. Kaufman, Las Vegas, Nev., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Sep. 12, 1985, Ser. No. 775,178

Int. Cl.[4] G07F *17/34*

U.S. Cl. 273—143 R **12 Claims**

1. In a gaming device having a first random means for determining a win in response to a player input and means for providing a payout to the player in response to a win determination, apparatus for providing an indication of future random multiple payouts comprising:

counter means increments in response to said win determination for providing a count representing the number of win determinations;

second random means for generating a multiple payout random number;

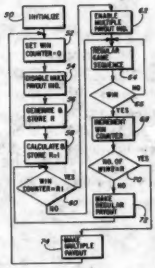
means for comparing the win determination count to the multiple payout random number to determine whether said count equals said number;

means responsive to said first random means and said comparing means for controlling the payout means to provide a multiple payout to the player if the win count equals the multiple payout random number;

means for indicating a multiple payout; and

means for enabling said multiple payout indicating means to provide an indication that a multiple payout will be made for a win determination which occurs after a predetermined number of wins has occurred.

10. A method for providing an indication of future multiple random payouts in a gaming device having a means for determining a win in response to a player input and a means for providing a payout to the player in response to a win determination comprising:



counting said determined wins to provide a count representative thereof;

generating a multiple payout random number;

comparing the determined wins count to said multiple payout random number;

controlling the payout means to provide a multiple payout to the player if said count equals said random number; and

indicating that a multiple payout will be made for a win determination which occurs after a predetermined number of wins has occurred.

4,624,460

GOLF CLUB HEAD

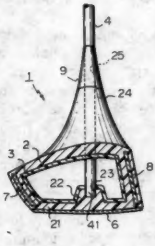
Yoshihiko Murase; Seiya Nishimura, and Osamu Tomita, all of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 22, 1984, Ser. No. 592,246

Claims priority, application Japan, Mar. 24, 1983, 58-049351; Apr. 8, 1983, 58-061967

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—167 H **7 Claims**



1. An improved golf club head having a dual hole joint structure for attaching a club shaft thereto, said golf club head comprising a fiber reinforced plastic cavitous shell having a

hollow interior, said shell forming a neck section having a first shaft hole extending between the interior and exterior of said shell, and a sole side section opposing said neck section, said sole side section having an inner surface defining a portion of the interior of said shell, a bulge formed upon said inner surface of said sole side section and projecting inwards therefrom into the interior of said shell, said bulge having a blind second shaft hole formed therein in axial alignment with said first shaft hole, said first and second shaft holes being spaced apart by a portion of the interior of said shell, and a club shaft secured in and extending through said first shaft hole with the distal end of said shaft being secured and almost fully received in said blind second shaft hole, whereby a portion of said shaft between the secured portions thereof extends freely within the interior of said shell so as to provide a dual hole joint structure for said club shaft.

4,624,461

GOLF PRACTISING DEVICES

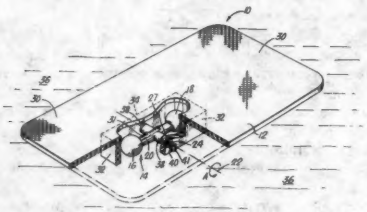
Denys R. Way, Braintree, United Kingdom, assignor to Golfing Way Limited, United Kingdom

Filed Jul. 31, 1984, Ser. No. 636,171

Claims priority, application United Kingdom, Aug. 9, 1983, 8321410; Apr. 19, 1984, 8410271

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—184 B **4 Claims**



1. A golf practising device which, when struck by a golf club, simulates the feel of hitting a conventional golf ball, said device comprising

a base structure,

a non-rotatable axle mounted in a fixed position on a horizontal axis to said base structure,

An elongated mounting member pivotally rotatable at its centre point about said non-rotatable axle,

a golf ball member mounted on each end of said mounting member, both said ball members and said mounting member being molded integral one with another of the same material, said ball members being substantially freely rotatable in a vertical plane while being retained in the immediate vicinity of said base structure, and said ball members counterweighting each other during rotation thereof, and

reinforcing means mounted on said integral golf ball and mounting members, said reinforcing means extending substantially at right angles to said horizontal axis, said reinforcing means projecting outwardly from the faces of said mounting member, said reinforcing means comprising

firstly a reinforcing member on each side face of said mounting member, each side face reinforcing member extending lengthwise from said golf ball members to the central portion of said mounting member, and

secondly a reinforcing member on each of the front and rear faces of said mounting member, said front and rear face reinforcing members each extending lengthwise only part way between said golf ball members, said front face reinforcing member extending from one of said golf ball members and said rear face reinforcing member extending from the other of said golf ball members.

4,624,462

ELECTRONIC CARD AND BOARD GAME

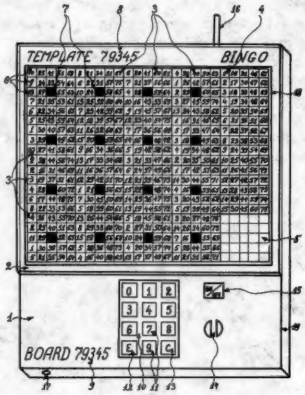
Yuri Itkis, 759-H Arcadia Ave., Arcadia, Calif. 91006

Continuation-in-part of Ser. No. 301,118, Aug. 11, 1981, Pat. No. 4,455,025. This application May 18, 1984, Ser. No. 611,951

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[4] A63F *3/06*

U.S. Cl. 273—237 **7 Claims**



1. In combination, a predetermined set of game cards and a game network for playing a game utilizing said predetermined set of game cards;

said game network comprising:

at least one master game board incorporating a master data input means, a master data processing means responsive to said master data input means, and a master data output means responsive to said master data processing means,

at least one player's game board incorporating a player's input means responsive to said master data output means, a player's data processing means responsive to said master data output means, and a player's data output means responsive to said player's data processing means;

said master game board transmitting via said master data output means predetermined data relevant to said game, and random data at least partially matching said predetermined set of game cards;

said player's game board comprising

means for receiving said predetermined data and said random data via said player's data input means,

means for storing an informational content of at least one game card out of said predetermined set in said player's data processing means,

comparison means for comparing said predetermined data and said random data on one hand, and said informational content on the other hand, and

means for signalling the current status of said card game via said player's data output means as determined by said comparison.

4,624,463

PROCEDURE AND RULES FOR PLAYING INDY CLASS 500

Kenneth W. Glennon, 365 N. Wilson St., Hobart, Ind. 46342

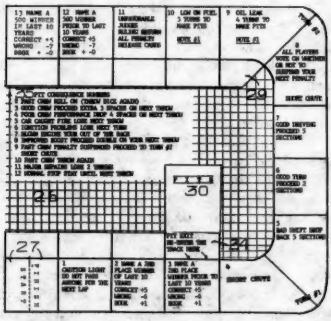
Filed May 24, 1984, Ser. No. 596,924

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—246 **7 Claims**

1. A game comprising a board with an oval course having a plurality of marked sections simulating an Indy Class auto race track layout, with a start/finish;

said marked sections providing movement information and certain of said sections including questions concerning knowledge of Indy Class racing, said sections which contain a question having further indicia indicating further player advancement, lesser advancement, and indicia



retarding the advancement of the player, said indicia used when a player gives a correct or incorrect answer to said question;

a pit lane following the inner two thirds of the said course and terminating at a specified section.

4,624,464

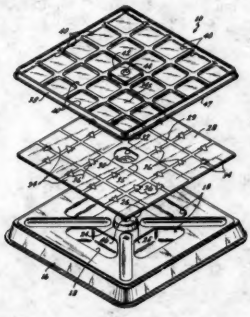
GAME TURNTABLE

George F. Propsom, Racine, Wis., assignor to Western Publishing Company, Inc., Racine, Wis.

Filed Feb. 17, 1984, Ser. No. 581,169

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—280 **2 Claims**



1. A game comprising:

(a) game base including a plurality of hollow pockets and a frustum shaped central hub;

(b) a playing board which is removably mounted to said base in a non-rotatable position; and

(c) a transparent overlay rotatably mounted to said base over said playing board for rotation with respect to said base and said playing board on said frustum shaped central hub extending between the base and the overlay, and whereby said overlay contains pockets therein and wherein said base is molded from plastic and said frustum shaped central hub having a flattened portion formed integrally therein and said hub having a top surface with a bearing formed therein, the central hub further including a central depression formed in the top surface thereof cooperating with a corresponding central depression formed centrally in the overlay, whereby the overlay may be rotated about the depression with respect to the base and the playing board.

4,624,465

PNEUMATIC SAFETY SEAL JOINT MADE OF ELASTOMER WITH INTERNAL SEPTUM

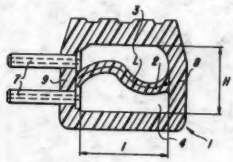
Jean Rogemont, St Chamond, France, assignor to CEFILAC, Paris, France

Filed Aug. 26, 1985, Ser. No. 769,028

Claims priority, application France, Aug. 30, 1984, 84 13681

Int. Cl.[4] F16J *15/46*

U.S. Cl. 277—34 **7 Claims**



1. A pneumatic safety seal joint made of elastomer, comprising:

an external seal wall;

a base; and

two lateral walls connecting side base and seal wall, thereby defining an internal volume with a maximum internal width l between said two lateral walls and maximum internal height H between said external seal wall and said base; and

an internal seal septum which divides said internal volume into two chambers, each said chamber having a means of pressurization, wherein said internal seal septum is connected to said lateral walls such that the respective volumes of the two chambers are in a ratio between 0.9 and 1.1, and wherein:

when l/H is between 1 and 2, a developed width L of said sealed septum at rest is between 1.1 times and 1.4 times said internal width l;

when l/H is between 2 and 8, said developed width L is such that:

$$1 \leqq L \leqq 1.21.$$

4,624,466

ROTARY CHUCK

Josef Steinberger, Düsseldorf, Fed. Rep. of Germany, assignor to Paul Forkardt GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 481,072, Mar. 31, 1983, abandoned. This application Aug. 5, 1985, Ser. No. 762,773

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212761

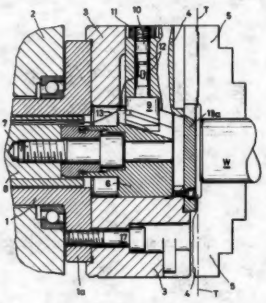
Int. Cl.[4] B23B *31/16*

U.S. Cl. 279—1 R **6 Claims**

1. A rotary chuck for machine tools with multiple clamping jaws guided in radial direction in a chuck body, said jaws beig actuatable via a direction-changing drive mechanism by a drive element shiftable in axial direction by a drive so that said clamping jaws move in radial direction with the chuck body for gripping respectively releasing a workpiece, whereby said clamping jaws are subdivided into a base jaw and a top jaw for adaptation to different diameters of workpieces to be clamped therewith, said top jaw being secured interchangeably on the base jaw and also being secured therewith displaceably relative to the base jaw, and whereby the base jaw remaining in the chuck body during changing and adjustment of the top jaw cooperates with the direction-changing drive mechanism,

whereby for determination of the clamping force applied to the workpiece by the clamping jaws there is provided the improvment therewith comprising:

at least one force measuring strip arranged in the chuck body, said force measuring strip being arranged respectively in the base jaw so that for prevention of any interruption of any signal line during changing, as well as displacement of the top jaw, such that radial force introduced by the drive element via the direction-changing drive mechanism into the base jaw is determined, and accordingly the force detection occurs at a location which



lies after the direction-changing drive mechanism but before a separation point between the base jaw and the top jaw, so that the connection of said force measuring strip with the signal line is kept from being separated during achange of said top jaw; said direction-changing mechanism including a wedge hook separate from said base jaw, and a neck-down shaft that is provided to secure said wedge hook non-rotatably on said base jaw, whereby radial force is introduced via said necked-down shaft into said base jaw, said at least one force measuring strip being arranged on said necked-down shaft.

4,624,467

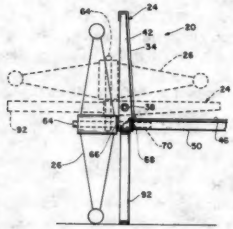
FOLDABLE UTILITY CART

Richard H. Burns, 662 Clarendon Rd., Troy, Ohio 45373

Filed Oct. 17, 1985, Ser. No. 788,323

Int. Cl.[4] B62B *1/12*

U.S. Cl. 280—40 **13 Claims**



1. A foldable utility cart, comprising:

(a) a floor;

(b) a pair of opposite side panels;

(c) pivot means interconnecting and mounting said side panels to said floor for pivotal movement of each of said side panels relative to said floor between an erected transport position in which said side panels together with said floor form a load supporting cavity and a folded storage position in which said side panels overlie said floor so as to eliminate said cavity, said pivot means being disposed outside of said load supporting cavity where said pivot means is unexposed to matter contained therein;

(d) a pair of ground engagable wheels;

(e) a pair of axle means attached to said respective side panels and rotatably mounting said ground wheels on said respective side panels at respective sides thereof opposite to said floor and outside of said load supporting cavity such that said ground wheels are movable as a unit with said side panels between said erected transport positions and said folded storage positions; and

(f) a pair of latching means disposed outside of said load supporting cavity below said floor and adjacent said respective wheels, each of said latching means being actuatable between unlatching and latching positions for respectively unlocking one of said wheels from said floor to allow pivoting of said side panel mounting said wheel to its folded storage position and locking said one wheel to said floor when said side panel has pivoted to its erected transport position such that said side panel is retained in its erected position;

(g) each said axle means extending transversely of its respective one side panel and away from a side thereof adjacent to said floor so as to underlie said floor at an inner end of said axle means when said side panel has pivoted to its erected transport portion;

(h) each said latching means including a latch member movably mounted to said floor on an opposite side thereof from said load supporting cavity and movable between said latching position in which a respective one of said axle means inner ends is engaged by said latch member and said unlatching position in which said one axle means inner end is disengaged from said latch member.

4,624,468

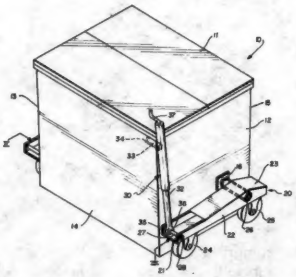
WHEEL CARRIAGE ACCESSORY FOR RENDERING WASTE CONTAINERS MOVEABLE

Donald R. Onken, P.O. Box 72, Easton, Ill. 62633

Continuation of Ser. No. 650,174, Sep. 13, 1984, abandoned. This application May 2, 1986, Ser. No. 858,877

Int. Cl.[4] B62B *13/18*

U.S. Cl. 280—43.2 **3 Claims**



1. First and second carriages for supporting and rendering movable a waste receptacle normally resting upon a surface, said receptacle having a front wall, a back wall and oppositely disposed side walls, oppositely disposed trunnion means extending from each of said side walls normal thereto forwardly of a vertical center line and near a bottom edge of said side walls, said waste receptacle including a socket with an opening in one of said side walls at a location near said back wall and near an upper edge of said side wall,

each of said first and second carriages comprising a channel-like longitudinal frame having a front end and a rear end, said frame having spaced vertically extending walls provided with aligned horizontal apertures, said frame further

having front and rear caster means mounted under said frame, said front caster being mounted forwardly of said aligned horizontal apertures in said vertically extending walls with the distance from said aligned horizontal apertures to said front end of said frame being less than the distance from said horizontal apertures to the bottom of said front caster,

a two-piece telescopic stabilizer bar having an upper end and a lower end the lower end being affixable to said rear end of one of said carriages,

said stabilizer bar including means for extending and retracting said lower end and said upper end with respect to each other, and a pin extending perpendicular from said upper end,

a lever means removably associated with one of said carriages, whereby said first and second carriages are mountable onto said oppositely disposed trunnion means on said waste receptacle at an angle relative thereto and said lever means is used to pivot each of said carriages in succession about said trunnion means thereby moving said caster means of each of said first and second carriages into contact with said surface thereby elevating said waste receptacle above said surface, and

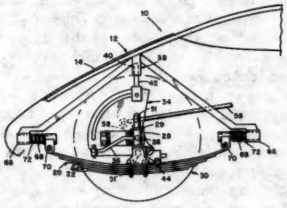
said pin on said stabilizer bar is extendable into said socket on said waste receptacle for positively locking said one carriage in its pivoted position with said caster means in a surface engaging position.

4,624,469

THREE-WHEELED VEHICLE WITH CONTROLLED WHEEL AND BODY LEAN

Maurice W. Bourne, Jr., Rte. 1, Marquez, Tex. 77865

Filed Dec. 19, 1985, Ser. No. 810,976
Int. Cl.[4] B62D *9/02*
U.S. Cl. 280—112 A **12 Claims**



1. A three-wheeled vehicle with controlled wheel and body lean having an elongate body with a longitudinal axis and a wheel rotatably mounted on one end of the body generally along the longitudinal axis of the body, comprising:

a cradle rotatably mounted on the body for rotation about a generally longitudinal axis relative to the body;

an axle connected to said cradle having an axis that is generally perpendicular to the axis of rotation of said cradle;

a pair of spindles, each spindle being connected to one of the opposite ends of said axle, respectively;

a pair of wheels, each wheel being rotatably mounted on one of said spindles, respectively;

means for connecting each of said spindles to said axle for providing at least pivotal motion of said spindles relative to said axle;

a tie rod having an axis generally parallel to the axis of said axle for controlling the pivotal motion of said spindles relative to said axle, said tie rod being movable through an arc about said axle;

means for pivotally connecting the ends of said tie rod to said spindles so that lateral movement of said tie rod generally parallel to the axis of said axle causes said spindles to pivot on the ends of said axle;

tie rod linkage means for holding said tie rod in a selected position disposed about the axis of said axle, and being configured to provide motion of said tie rod to positions between a first position forward of said axle through an approximately 90 degree arc to a second position generally vertically above said axle, while providing for lateral movement of said tie rod generally parallel to the axis of said axle;

coupling means for rotatably connecting said tie rod linkage to the body, said coupling means providing for rotation of said tie rod linkage relative to the body about an axis generally perpendicular to the axis of rotation of said cradle relative to the body; and

steering means for imparting a force to move said tie rod laterally so that when said tie rod is in said first position, lateral movement of said tie rod causes said spindles and wheels to pivot relative to said axle about an axis generally perpendicular to the axis of rotation of said cradle relative to the body, and when said tie rod is in said second position, lateral movement of said tie rod causes said spindles and wheels to pivot relative to said axle about an axis generally parallel to the axis of rotation of said cradle relative to the body and causes the body to rotate relative to said cradle; and

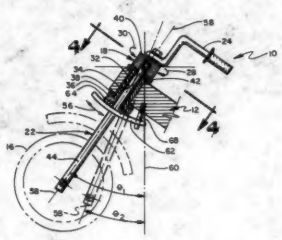
adjustment means for adjusting and holding said tie rod in any desired intermediate position along said 90 degree arc.

4,624,470

MOTORCYCLE STEERING MECHANISM

W. Gregory Love, 684 Tantra Dr., Boulder, Colo. 80303

Filed Sep. 20, 1985, Ser. No. 778,202
Int. Cl.[4] B62K *21/02*
U.S. Cl. 280—279 **29 Claims**



1. A steering mechanism for a motorcycle or other wheeled vehicle comprising:

a rotatable steering head assembly;

a front steering wheel;

a front fork assembly interconnecting said steering head assembly and said steered wheel such that rotation of said steering head assembly causes a concommitant turning of said steered wheel and said front fork assembly, said front fork assembly carrying said steered wheel at one end thereof and adapted for rotational movement about a generally upright axis to turn said steered wheel; and

means for variably controlling the fork angle of said front fork assembly as a function of the turning of said steered wheel.

4,624,471

TRACTOR EARTH-TREATING IMPLEMENT CONNECTOR

Kenneth M. Haines, Rte. 1, Box 384 D; Thomas D. Oder, Rte. 1, Box 384 C, both of Belvidere, N.C. 27919, and John E. Wood, III, Rte. 4, Box 179, Hertford, N.C. 27944

Filed Aug. 2, 1985, Ser. No. 762,074
Int. Cl.[4] A01B *49/06*
U.S. Cl. 280—411 R **7 Claims**

1. A tractor earth-treating implement connector of a type for

allowing a tractor to simultaneously operate a plurality of earth-treating implements, said connector comprising:

a towing hitch means for attaching said earth-treating implement connector to a prime-moving tractor for allowing said prime-moving tractor to tow said connector and attached earth-treating implements over earth to be treated;

an elongated rigid frame attached to said towing hitch means, said elongated rigid frame comprising at a leading end thereof a leading, substantially upright, section attached to said towing-hitch means, at a trailing end thereof, a trailing, substantially upright, section, and at a mid-section thereof an elevated, relatively level, section interconnecting upper end portions of said leading and trailing upright sections whereby said elongated rigid frame forms an inverted U-shape when viewed from its side with an open space formed between the leading and trailing upright sections, said leading upright section thereof including fixed supports integral therewith positioned and dimensioned for allowing a first remote-controlled three-point hitch to be mounted on the trailing side thereof for attachment to, and operation of, an earth-treating implement in said open area between said leading and trailing upright sections, said trailing upright section having attached thereto fixed supports positioned and dimensioned for allowing a second remote-controlled three-point hitch to be mounted at the trailing end of said connector for allowing a remote-controlled three-point hitch to be mounted at the trailing end of said connector for attachment to and operation of an earth-treating implement trailing said connector; and,

first and second remotely operable three-point hitches respectively mounted to said fixed support on the trailing side of said leading upright section and at the trailing end of said connector;

said leading upright section of said elongated frame comprising left and right side upright posts positioned at the sides thereof, and an upper horizontal beam extending between said left and right side upright posts, said first three-point hitch having lower parallel links pivotally coupled to said leading upright section at an approximate level of said towing hitch means during normal operation thereof, and an upper parallel link pivotally coupled to said upper horizontal beam which is located approximately 24 inches above the connections of said lower parallel links to said leading upright section;

whereby said connector, with its first and second three-point hitches can be readily connected to at least two earth-treating implements chosen from a variety of off-the-shelf earth-treating implements made for operation with three-point hitches for simultaneously towing the earth-treating implements, one behind the other and controlling vertical movement of the implements remotely from said tractor.

4,624,472

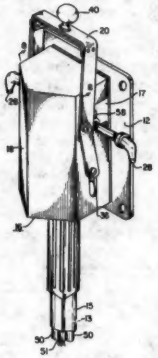
COUPLING MECHANISM FOR COUPLING FLUID AND ELECTRICAL LINES BETWEEN ADJACENT VEHICLES

Clifton F. Stuart, Rte. 1, Box 137, Lynnville, Tenn. 38472, and Harold E. Eskridge, 3196 Wadsworth Rd., Norton, Ohio 44203

Continuation-in-part of Ser. No. 571,784, Jan. 18, 1984, abandoned. This application Jun. 6, 1985, Ser. No. 742,212

Int. Cl.[4] **B60D** *1/08;* **H01R** *13/44;* **H01B** *7/14*

U.S. Cl. 280—420 **23 Claims**



1. A coupling mechanism for coupling elongated flexible energy conveying lines such as fluid and electrical lines between adjacent coupled vehicles comprising, a plurality of such elongated flexible lines grouped together to form a unitary elongated flexible group line, one end of said group line connected to respective energy sources on one vehicle and the other end of said group line connected to respective energy loads on another vehicle through a single hybrid or combination plug and socket apparatus;

said plug and socket apparatus including a first mounting bracket secured to said other vehicle and a second mounting bracket secured to said other end of said group line and adapted for mating and prealigned hanging engagement with respect to said first mounting bracket, and plug and socket members secured, respectively, to said first and second mounting brackets to be thereby prealigned for operative engagement of said plug and socket members when said mounting brackets are in said hanging engagement, and moveable drive means cooperable with said plug and socket apparatus to drive said plug and socket members axially into operative engagement after such prealignment thereof.

4,624,473

HEEL BINDING

Walter Knabel, Murnau; Josef Hafner, Grobenzell, and Martin Scheer, Munich, all of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah

PCT No. PCT/EP84/00091, § 371 Date Nov. 30, 1984, § 102(e) Date Nov. 30, 1984, PCT Pub. No. WO84/03841, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 30, 1984, Ser. No. 678,562

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311901

Int. Cl.[4] **A63C** *9/08*

U.S. Cl. 280—612 **14 Claims**

12. A safety ski binding attachable to a ski for releasably holding a ski boot on the ski, said binding having forward and rearward directions and comprising:

base plate means;

release means actuable in response to the occurrence of

forces or moments reaching a predetermined threshold value;

carriage means mounted on said base plate means for movement in the forward and rearward directions;

carriage spring means disposed between said base plate means and said carriage means for biasing said carriage means in the forward direction;

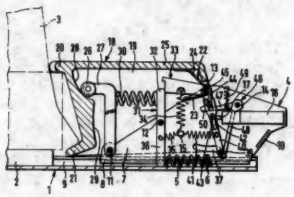
sole holder means mounted on said carriage means and movable between a closed position for engaging a ski boot to retain the boot in the binding, and an open position for releasing the ski boot from the binding;

sole holder biasing means for biasing said sole holder towards said open position;

pivot means attached to said carriage means;

locking means for releasbly locking said sole holder means in the closed position, said locking means comprising

lever means mounted on said pivot means, said lever



means having a first condition for retaining said sole holder means in the closed position and a second condition for enabling said sole holder means to move to the open position,

locking pawl means having a locking position for holding said lever means in the first condition and an unlocking position for releasing said lever means to assume the second condition; and

restoring means for urging said lever means to the first condition; and

connecting means interconnecting said release means and said locking pawl means, said connecting means moving said locking pawl means from the locking position to the unlocking position in response to the actuation of said release means, to transfer said locking means to the second condition and disable said carriage spring means from opposing movement of said carriage means in the rearward direction.

4,624,474

STEP-IN YIELDING HEEL PIECE FOR SAFETY SKI BINDING

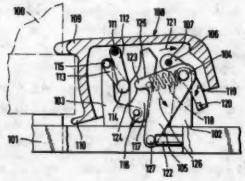
Gerd Klubitschko, Oberau, and Premak Stepanek, Garmisch-Partenkirchen, both of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah

PCT No. PCT/EP83/00032, § 371 Date Oct. 5, 1984, § 102(e) Date Oct. 5, 1984, PCT Pub. No. WO84/03050, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 11, 1983, Ser. No. 658,916

Int. Cl.[4] A63C *9/082, 9/088*

U.S. Cl. 280—612 **18 Claims**



1. A heel piece for a step-in, yielding electronic ski binding for releasably latching a ski boot from the binding upon actuation of a cockable release actuator, said heel piece comprising:

sole plate means fixable to ski;

housing means including sole engaging means for engaging the sole of a ski boot;

connection means interconnecting said housing means and said sole plate means for movement of said housing means between latching and releasing positions, said connection means including a first link arm having first and second ends, said first end being pivotally connected to axle means and said second end being pivotally connected to said housing, said axle means movable along a predetermined path as said housing means moves between said latching and releasing positions;

cam means pivotal about an axis stationary with respect to said base plate, said cam means including surface means bearing on said axle means for urging said axle means to move said housing means toward its latching position;

latching lever means, separate from said cam means, pivotal about an axis stationary relative to said sole plate means for releasably latching said housing means in its latching position, said latching lever means including surface means for engagement with said axle means, said lever surface means operative with said cam surface means for preventing movement of said housing means beyond a limited range when said housing is in its latching position; and

cocking means for cocking the cockable release actuator when said housing means is moved to its latching position.

4,624,475

RELEASE SKI BINDING

Gerhard Nowak, Biedermannsdorf; Alfred Winter; Hans P. Morbitzer, both of Vienna, and Klaus Kruschik, Gumpoldskirchen, all of Austria, assignors to TMC Corporation, Baar, Switzerland

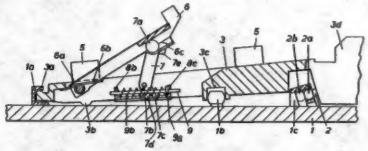
Filed Jan. 19, 1984, Ser. No. 572,099

Claims priority, application Austria, Jan. 21, 1983, 192/83

The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.

Int. Cl.[4] A63C *9/081*

U.S. Cl. 280—618 **18 Claims**



1. In a release ski binding comprising a sole plate pivotally supported on a ski in its central region about an approximately vertical axis and about a transverse axis arranged in front of said vertical axis, which in the skiing position is held on said ski by a holding mechanism which is biased by a release spring, said release spring responding to a swivelling movement of said sole plate relative to said ski upon reaching a predetermined angle of traverse to effect both upwardly and also to the side an opening of a locking mechanism, the improvement comprising wherein said locking mechanism includes:

two pairs of laterally spaced clamping jaws adapted to laterally engage a ski shoe, each clamping jaw being constructed as a two-arm lever;

pivot means for pivotally supporting each said clamping jaw on said sole plate and for movement between a ski shoe holding position and a ski shoe releasing position;

slide-member plate means movably guided on said sole plate and having wedge-shaped shoulder means thereon engagable with one arm of each of said clamping jaws to urge each said clamping jaw into said ski shoe holding position;

said release spring continually urging said slide-member plate means and said wedge-shaped shoulder means thereon toward and into engagement with said one arm of each of said clamping jaws;

stepping bar means adapted to be stepped down upon by a ski shoe pivotally supported on said sole plate and movable between an upstanding position inclined to the upper surface of said sole plate and a generally horizontal position parallel to the upper surface of said sole plate; and

control means responsive to the position of said stepping bar means for moving said slide-member plate means and said wedge-shaped shoulder means away from said one arm of each of said clamping jaws when said stepping bar means is inclined to the upper surface of said sole plate and against the resilient urging of said release spring and for effecting said slide-member plate means to move toward said one arm of each of said clamping jaws under the urging of said release spring when said stepping bar means is in said generally horizontal position.

4,624,476

VEHICLE SUSPENSION APPARATUS

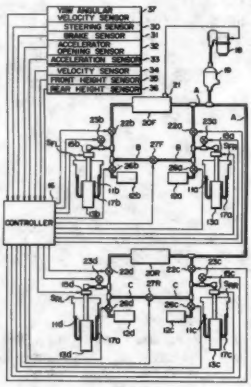
Tadao Tanaka, Okazaki; Sunao Chikamori, Nagoya; Mitsuhiko Harara; Shinichi Takeuchi, both of Okazaki; Masanaga Suzumura, Nagoya; Minoru Tatemoto, Okazaki; Naotake Kumagai, Aichi, and Hiroki Abe, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,677

Claims priority, application Japan, Jan. 24, 1984, 59-7191[U]; Jan. 24, 1984, 59-7199[U]; Jan. 24, 1984, 59-7200[U]; Jan. 24, 1984, 59-7206[U]; Jan. 24, 1984, 59-7218[U]; Jan. 24, 1984, 59-7220[U]

Int. Cl.⁴ B60G *17/00*

U.S. Cl. 280—707 **8 Claims**



1. A suspension apparatus comprising:

suspension units mounted on respective wheel, each unit having a fluid spring chamber;

fluid supply means for supplying a fluid to each fluid spring chamber through a fluid supply valve;

a plurality of communication paths each coupled between right and left fluid spring chambers and having a communicating control valve which is closed to achieve a roll control;

fluid exhaust means for exhausting the fluid from each fluid spring chamber through a fluid exhaust valve;

steering angle detecting means for detecting a steering wheel angle;

velocity detecting means for detecting a vehicle velocity;

control quantity determining means for determining a roll control quantity in accordance with the steering angle detected by said steering angle detecting means and the velocity detected by said velocity detecting means; and

roll control means for controlling rolling of a vehicle body by opening/closing said fluid supply valves and said fluid exhaust valves in accordance with the roll control quantity determined by said control quantity determining means, so that the fluid is supplied to said fluid spring chambers of the contracted suspension units with respect to a roll direction and the fluid is exhausted from said fluid spring chambers of the elongated suspension units when a vehicle changes a position thereof so as to control a change in the position of the vehicle.

4,624,477

AUTOMOBILE SUSPENSION SYSTEM

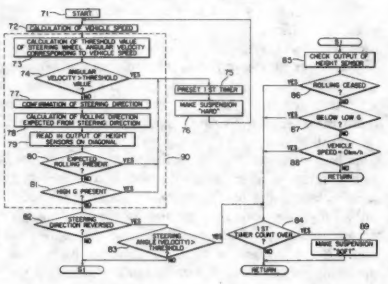
Naotake Kumagai; Minoru Tatemoto; Shunzou Oshima; Mitsunori Maruyama, all of Okazaki; Shunichi Wada, and Setsuhiro Shimomura, both of Himeji, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 713,756

Claims priority, application Japan, Mar. 27, 1984, 59-58768

Int. Cl.⁴ B60G *17/00*

U.S. Cl. 280—707 **13 Claims**


START
CALCULATION OF VEHICLE SPEED
CALCULATION OF THRESHOLD VALUE OF STEERING WHEEL ANGULAR VELOCITY CORRESPONDING TO VEHICLE SPEED
ANGULAR VELOCITY>THRESHOLD VALUE
PRESET 1ST TIMER
MAKE SUSPENSION "HARD"
CONFIRMATION OF STEERING DIRECTION
CALCULATION OF ROLLING DIRECTION EXPECTED FROM STEERING DIRECTION
READ IN OUTPUT OF HEIGHT SENSORS ON DIAGONAL
EXPECTED ROLLING THEREBY
HIGH G PRESENT
STEERING DIRECTION REVERSED
STEERING ANGLE VELOCITY> THRESHOLD
1ST TIMER COUNT OVER
MAKE SUSPENSION "SOFT"
RETURN
CHECK OUTPUT OF HEIGHT SENSOR
ROLLING CEASED
BELOW LOW G
VEHICLE SPEED > 0km/h
RETURN

1. A suspension system for an automobile comprising a suspension having variable characteristics changeable according to an operating condition of the vehicle, and at least one of a vehicle speed sensor means for detecting the speed of the vehicle, a steering wheel sensor means for detecting the steering condition of the vehicle's steering wheel, a vehicle height sensor means for detecting the height of the vehicle body relative to the vehicle wheel or the vehicle wheel axle and corresponding to a plurality of classified height ranges, and an acceleration sensor means for detecting the acceleration of the vehicle; said system further comprising:

a first means for detecting commencement of the turning movement of the vehicle on the basis of at least one of the output signals from said vehicle speed sensor means, said steering wheel sensor means, said vehicle height sensor means, and said acceleration sensor means, and for changing the suspension characteristic to a first value representing a hard condition; and

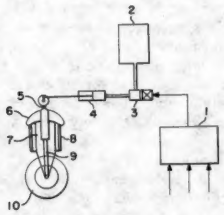
a second means for detecting completion of the turning movement of the vehicle on the basis of at least one of the output signals from said vehicle speed sensor means, said steering wheel sensor means, said vehicle height sensor means, and said acceleration sensor means, and for changing the suspension characteristic to a second value representing a soft condition.

4,624,478

SUSPENSION DEVICE FOR AUTOMOBILE

Shigeki Ohtagaki; Shunichi Wada; Yasuaki Hata, all of Himeji; Shozo Takizawa, and Mitsunori Maruyama, both of Okazaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,540
Claims priority, application Japan, Aug. 25, 1983, 58-156803
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—707 8 Claims



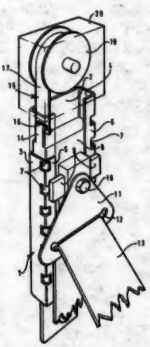
1. A suspension device for an automobile, comprising a pressure source, an electromagnetic valve for transmitting and breaking fluid pressure of said pressure source, an actuator for converting the fluid pressure transmitted through said electromagnetic valve into a kinetic movement, a rod turned by the movement of said actuator, a shock absorber having a damping force changed by turning said rod and a suspension spring having a spring constant changed by the turning said rod, wherein said pressure source is used in common to a pressure source for a road clearance adjusting device for adjusting a change in road clearance.

4,624,479

SEAT BELT FITTING

Hans-Joachim Grunewald, Kiebtzreihe, Fed. Rep. of Germany, assignor to Autoliv Development AB, Vargarda, Sweden

Filed Nov. 21, 1984, Ser. No. 673,867
Int. Cl.[4] B60R *22/00*
U.S. Cl. 280—808 10 Claims



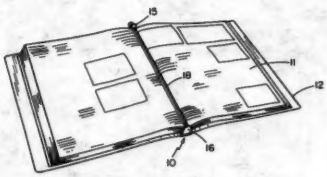
1. A seat belt arrangement comprising a guide element through which part of the seat belt passes, the guide element being mounted on a carriage that is movable along a rail or the like, manually operable means being provided on the carriage for selectively locking or retaining the carriage in a plurality of positions along said rail, means being provided to impart a bias to the carriage against any bias applied thereto by the seat belt, said bias imparting means comprising a spring strip, one end of which is connected to the carriage and the other end of which is wound into a spiral, the portion of the spring wound in a spiral being retained at substantially a predetermined position.

4,624,480

MAGAZINE AND DIRECTORY COVER AND HOLDER ASSEMBLY

Gregory A. Marthaler, 1969 Dorset Dr., Wheaton, Ill. 60187, and Robert H. Marthaler, 942 Sycamore La., Bartlett, Ill. 60103

Filed Jan. 10, 1986, Ser. No. 817,683
Int. Cl.[4] B42D *17/00*; B42F *13/20*
U.S. Cl. 281—49 11 Claims



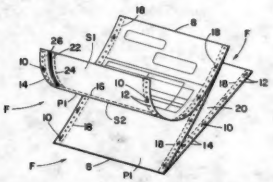
1. A cover binder for magazines, catalogues and other previously bound sheets, comprising: a one-piece plastic body including a base portion adapted to be fixed to the cover by fasteners, a bracket integral with and extending outwardly from each end of the base portion, a hinge integrally molded with one of the brackets, a binder blade pivotally supported on the one bracket by said hinge, said blade being pivotal in a plane extending through the blade and the base portion, said hinge having a flexible portion extending in a direction transverse to the pivotal plane of the blade to provide increased hinge life, and means on the other bracket for attaching the free end of the blade thereto.

4,624,481

COMBINATION MULTIPLE PLY MANIFOLD BUSINESS FORM AND AIRLINE TICKET JACKET

David M. Kercher, Littleton, Colo., assignor to Janet C. Kercher, Littleton, Colo., a part interest

Filed Feb. 25, 1985, Ser. No. 704,872
Int. Cl.[4] B41L *1/20*; B65D *27/00, 27/04*
U.S. Cl. 282—11.5 A 15 Claims



1. The multiple ply assembly form which comprises: a bottom ply, a top ply and at least one intermediate ply interposed between the top and bottom plies, said plies each having an upper edge, a lower edge and right and left side margins; means associated with two or more of the plies for transferring indicia imprinted on the top ply to the plies therebeneath; first serrations in all plies above the bottom ply extending horizontally thereof from side margin to side margin intermediate their upper and lower edges, said serrations providing means for separating said plies into upper and lower sections; adhesive means extending along one of the upper or lower edges and at least one side margin of the upper or lower section adjacent said one edge fastening said next above ply to the bottom ply therebeneath, said plies thus fastened together cooperating

with one another to define a pocket open along the first serrated edge of said next above intermediate ply, and said section of said bottom ply remote from said one edge defining a flap foldable over said pocket containing such indicia as may have been imprinted upon said remote section of the top ply.

4,624,482

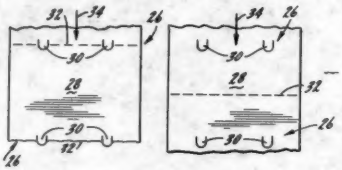
ELONGATED SHEET OF MATERIAL

Wayne R. Cassells, 6S530 Dunlap Rd., Naperville, Ill. 60540

Filed Jul. 13, 1984, Ser. No. 630,876

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—62 **11 Claims**



1. An elongated printed stamp sheet for use in a dispenser having driving pins for engagement with sprockets in the elongated sheet, comprising a single layer having a plurality of partially cut spaced apart flap groups formed in a predetermined spacing along the length of the elongated sheet, the sheet further comprising a series of perforated score lines formed at predetermined positions transversely along the elongated sheet, the perforated score lines and flap groups being formed on the single layer of the sheet, the partially cut, spaced apart flat groups remaining with the sheet thereby leaving the printed material intact on the sheet while serving as sprockets for driving the sheet with the driving pins, the perforated score lines allowing the sheet to be separated as desired along the score lines.

4,624,483

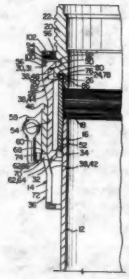
QUICK CONNECT COUPLER

James L. Stromberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 296,325, Aug. 26, 1981, Pat. No. 4,522,430, which is a continuation-in-part of Ser. No. 238,802, Feb. 27, 1981, abandoned. This application Feb. 19, 1986, Ser. No. 831,111

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—24 **16 Claims**



1. A coupling for connection to a cylindrical member having a radially outward extending shoulder, said coupling comprising:

a body member, said body member including a radially outer surface having an annular groove therein;

annular seal means for sealing between said body member and said cylindrical member;

a plurality of collet sections disposed around said body member, each of said collet sections having a first end connected to said body member by engaging the radially outer surface having an annular groove therein of said body member and a second end adapted for engagement with a longitudinally inward facing surface of a radially outward extending shoulder of said cylindrical member;

an outer sleeve slidably disposed about said plurality of collet sections, said sleeve being slidable relative to said collet sections between an open position wherein said second ends of said collet sections are held in a relatively radially expanded position so that they may receive said shoulder of said cylindrical member therebetween, and a closed position wherein said second ends of said collet sections are held in a relatively radially contracted position for engagement with said surface of said outwardly extending shoulder; and

release means, operably associated with said plurality of collect sections and said outer sleeve, for moving said second ends of said collet sections to their said relatively radially expanded position upon sliding of said outer sleeve from its closed position to its open position, said release means including:

a radially outer tapered cam surface on said outer sleeve; and

a plurality of cam follower members, each cam follower member of said plurality of cam follower members being attached to said second end of each of said collet sections and having a follower surface defined thereon for engagement with said outer cam surface

whereby said cam surface and cam follower members of said release means are arranged and constructed such that upon movement of said sleeve from its closed position to its open position such movement thereby moves said outer cam surface into engagement with said follower surfaces and, in turn, thereby cams said second ends of collet sections radially outward away from said shoulder of said cylindrical member.

4,624,484

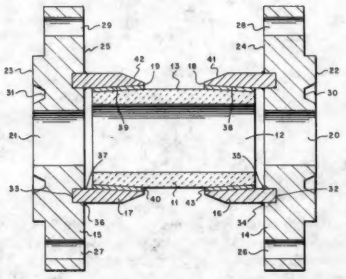
SHRINK-FIT CONNECTOR FOR ELECTRICAL WELL SUBSURFACE HEATING PROCESSES

Robert Wilson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 13, 1984, Ser. No. 620,281

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—45 **17 Claims**



1. An insulating connector for a wellhead of an electrode well comprising a tubular ceramic member having a central generally cylindrical shaped internal flow passage extending therethrough; said ceramic member having a generally cylin-

drical shaped outer surface; two opposed iron base metal bolt type flange members; said iron base metal having a thermal coefficient of expansion greater than the thermal coefficient of expansion of the ceramic; each of said flange members having a central generally cylindrical shaped internal flow passage extending therethrough; one of said flange members being adapted to be connected to and disconnected from a part of a wellhead and the other of said flange members being adapted to be connected to a well string without exerting a substantial torque on said ceramic member; each of said flange members having a generally coaxial tubular section with an inner end; said tubular sections each forming at least a part of said flow passage extending through said flange member; each of said tubular sections having parts overlapping and extending over and around an end of said ceramic member by a distance of at least one inch and in a manner such that said inner ends of said tubular sections are substantially spaced apart; a layer of a second metal between said parts of said tubular sections and said outer surface of said ceramic member where said tubular sections overlap said ceramic member; said second metal having a yield strength less than said iron base metal of said tubular sections of said flange members and having a thermal coefficient of expansion greater than the thermal coefficient of expansion of said iron base metal in said flange member, and said tubular sections each having been heat-shrink fitted to said ceramic member.

4,624,485

INSULATING TUBULAR CONDUIT APPARATUS

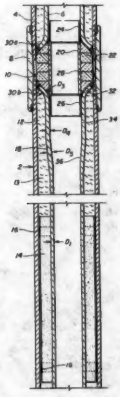
David M. McStravick, and David V. Chenoweth, both of Houston, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Continuation of Ser. No. 513,456, Jul. 13, 1983, Pat. No. 4,480,371, which is a division of Ser. No. 272,411, Jun. 10, 1981, Pat. No. 4,396,211. This application May 17, 1984, Ser. No. 611,188

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.[4] F16L *9/18*

U.S. Cl. 285—47 **7 Claims**



1. A concentric walled tubular conduit forming a tubular string in a subterranean well to transport a fluid between the surface and a subterranean producing formation in an oil well, the temperature of the fluid being greater than the surrounding temperature in the well, comprising: an outer tubular member prestressed in compression and having threads on each end thereof; an inner tubular member prestressed in tension, and concentrically received within and spaced from the inner periphery of said outer tubular member; insulating material surrounding said inner tubular member; said inner tubular member having both of its ends outwardly flared and respectively welded directly to the inner surface of the outer tubular member adjacent the threaded ends; each end of said inner tubular member being thereby rigidly sealably secured to the adjacent ends of said outer tubular member to define a sealed cavity between said tubular members; the rigidly welded, flared ends comprising means for transmitting forces due to differential thermal expansion and contraction along the entire length of the inner and outer tubular members between the outer and inner tubular members, differential thermal expansion forces being transmitted through the flared ends and the welds; both ends of the inner tubular conduit being respectively welded to the inner surface of the outer tubular conduit at a position intermediate the length of the threads on each end thereof.

4,624,486

STRUCTURE AT RESIN PIPE CONNECTIONS

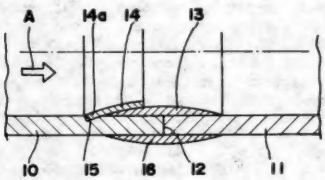
Yoshinori Nishino, Yamato-takada; Masahiko Yamamoto, Nishinomiya; Tadayoshi Uda, Izumi; Tomoyoshi Kanazawa, Kobe, and Kenji Nakagawa, Osaka, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Apr. 12, 1983, Ser. No. 484,256

Claims priority, application Japan, Nov. 12, 1982, 57-172137[U]; Nov. 12, 1982, 57-172138[U]; Nov. 12, 1982, 57-172139[U]

Int. Cl.[3] F16L *9/14*

U.S. Cl. 285—55 **5 Claims**



1. A pipe connection structure wherein one end of a first resin pipe is opposed to one end of a second resin pipe in direct face-to-face contact, the structure comprising an inwardly projecting annular connecting resin body bridging over the inner peripheries of the opposed ends of the first and second pipes for connecting them together, and an annular reinforcing resin body at least partly covering the connecting resin body and having an end portion extending on the first pipe beyond one end of the connecting resin body, said end portion being received in an annular recess formed in the inner periphery of the first pipe.

4,624,487

MOLDED TAPPING FITTING FOR CONNECTING A BRANCH LINE TO A PIPELINE

Alfred Thalmann, Uhwiesen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Aug. 6, 1985, Ser. No. 762,952

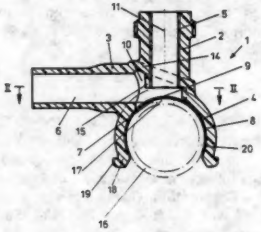
Claims priority, application Switzerland, Aug. 8, 1984, 3812/84

Int. Cl.[4] F16L *41/00*

U.S. Cl. 285—197 **10 Claims**

1. Molded tapping fitting for connecting a branch line to a pipeline comprising a shell-shaped saddle piece arranged to be radially placed on and secured to the pipeline, said saddle piece having an axis corresponding generally to the axis of the pipeline, an axially extending tubular tapping connection member having a first end and a second end with the second end secured to said saddle piece, the axis of said tapping connection member extends transversely of the axis of said saddle piece, and axially extending tubular branch line connection with the

axis thereof extending transversely of the axes of said saddle piece and of said tapping connection member and said branch line secured to and intersecting said tapping connection member, said saddle piece having a circumferentially extending inside surface arranged to seat against the pipeline and a circumferentially extending outside surface, said branch connection line intersecting said tapping connection member adjacent the outside surface of said saddle piece, said saddle piece having an opening therethrough from the outside surface to the inside surface with the opening aligned with said tapping connection member, and, in combination, said saddle piece said tapping connection member and said branch connection line forming a chamber opening to said opening in said saddle piece for facilitating flow between said branch connection line and the pipeline, said chamber spaced outwardly from said saddle piece and extending transversely of the tapping connection member axis is formed by a surface inclined from said branch connection line adjacent the intersection with said tapping connection member to the opposite side of said tapping connection member adjacent the connection between said tapping connection member and said saddle piece.

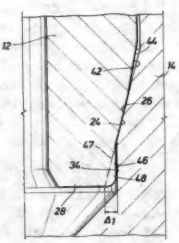


4,624,488

TUBULAR CONNECTION

David J. Furgerson, Kingwood, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Dec. 16, 1983, Ser. No. 562,448
Int. Cl.⁴ F16L *15/00*
U.S. Cl. 285—334 **27 Claims**



1. An improved tubular connection having a pin member and a box member defining an axis, said connection having interengaged threads on the respective members and said pin member having an internal frusto-conical surface inclining inwardly towards said axis adjacent an end of the pin member and said box member having a cooperating internal frusto-conical surface with an angle of incline substantially the same as that of the internal surface of the pin member, said pin and box internal surfaces being engaged upon make-up of the tubular connection, wherein the improvement comprises,

a pilot surface disposed from a distal-proximate end to a distal end of the pin member inclining to a lesser extent than said angle of incline of the engaged internal frusto-conical surfaces of the pin member and the box member thereby defining an increased end-of-pin flat thickness relative to an end-of-pin flat thickness defined by a surface inclined equal to or to a greater extent than the angle of incline of said engaged pin internal frusto-conical surface, said box member having a complementary non-engaging surface accepting said pilot surface of said pin member upon make-up of the tubular connection,

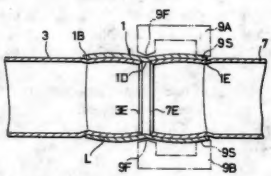
whereby said pilot surface and, therefore, said increased end-of-pin flat thickness allows positioning of said interengaged threads so as to provide an increased radial thickness of said box member thereby increasing the axial tensile strength capability and burst pressure rating of said connection while also protecting said internal surface of the pin member.

4,624,489

PIPE CONNECTION METHOD AND CONNECTING STRUCTURE

Matsuichi Nakamura, Osaka, Japan, assignor to Daiwa Steel Tube Industries Co., Ltd., Japan

Continuation-in-part of Ser. No. 401,003, Jul. 22, 1982, Pat. No. 4,541,659. This application Oct. 16, 1984, Ser. No. 661,418
Claims priority, application Japan, Oct. 25, 1983, 58-198343
The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.
Int. Cl.⁴ F16L *13/14*
U.S. Cl. 285—382 **8 Claims**



1. A connection method comprising the steps of providing a cylindrical joint member for connecting a first pipe and a second pipe inserted into opposite ends of said cylindrical joint member towards the center of said cylindrical joint member and holding said pipes in such a position that their ends are separated only by a narrow gap, and compressing both ends and the center of said cylindrical joint member to form airtight seals between said first and second pipes and the ends of said cylindrical joint member and also between the ends of said first and second pipes and the middle part of said cylindrical joint member.

4,624,490

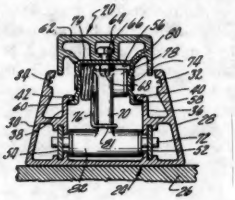
EXIT DEVICE FOR A DOOR

Theodore H. Miller, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 26, 1983, Ser. No. 535,509
Int. Cl.⁴ E05C *15/02*
U.S. Cl. 292—92 **20 Claims**

1. An exit device for a door comprising a rear channel member, a latch bolt assembly at one end of said channel member, a pair of spaced rails mounted in said rear channel member, said channel member including two sets of opposed longitudinally extending grooves in its interior forming tracks for said rails, said rails being mounted in said tracks, a push bar having a portion extending outwardly of said channel member, at least one connecting link pivotable attached at one end to said rails and pivotably attached at the other end to said push bar for

mounting said push bar in said channel for movement between a retracted position and a depressed position, said means inter-



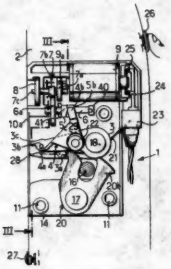
connecting said push bar and said latch bolt assembly to operate said latch bolt assembly when said push bar is moved.

4,624,491

ELECTRICALLY-OPENED LATCH, IN PARTICULAR FOR MOTOR VEHICLE DOORS

Bernard Vincent, Remiremont, France, assignor to Compagnie Industrielle de Mecanismes en abrege C.I.M., France

Filed Mar. 12, 1984, Ser. No. 588,602
Claims priority, application France, Mar. 14, 1983, 83 04139
Int. Cl.[4] E05C *3/00*
U.S. Cl. 292—201 **7 Claims**



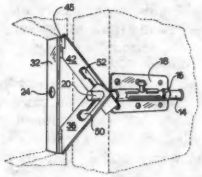
1. A latch for a motor vehicle door, said latch comprising a keeper, a case, a support plate, a bolt pivotally mounted on the support plate, a cath pivotally mounted on the support plate, a first resiliently yieldable element for returning the catch into cooperative engagement with the bolt, the catch being cooperative with the bolt so as to maintain the bolt in a closing position of the latch under the action of the first resiliently yieldable element, a lever rotatively mounted on the case, an electric control system for controlling the opening of the latch and capable of driving the lever and for pivoting the catch in opposition to the action of the first resiliently yieldable element and releasing the bolt and the keeper inserted in the bolt, the electric control system comprising a motor of sufficient power to overcome the resistance of the first resiliently yieldable element and having a low reversibility torque and a second resiliently yieldable element interposed between the motor and the lever, said second resiliently yieldable element being resiliently stressed by the motor and being resiliently released when the motor no longer carries current so as to return the motor to the initial position of the motor, the lever and the catch being resiliently returned to the initial position thereof after release of the bolt and the pivoting of the bolt to its opening position.

4,624,492

DOOR LOCKING AND RESTRAINING MECHANISM

Aaron L. Vidas, 461 Ann St., West Chicago, Ill. 60185

Filed Sep. 27, 1985, Ser. No. 780,981
Int. Cl.[4] E05C *17/32*
U.S. Cl. 292—263 **1 Claim**



1. A locking device for locking a door to a door jamb comprising:

a bolt member mounted to the door for selective reciprocal motion;

a locking plate mounted to the door jamb and having located therein an orifice arranged to receive said bolt member;

a first extension member pivotally mounted to one extremity of said locking plate and having a bolt member receiving slot defined in said first extension member and arranged to overlie said orifice in said locking pate while said first extension member is in a first position and to maintain engagement with said bolt member when said first extension member is pivoted out of said first position; and

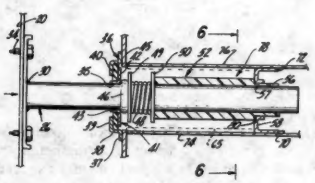
a second extension member pivotally mounted to said locking plate at its extremity opposite said first extension member and having a bolt member receiving slot defined therein arranged to overlie said orifice in said locking plate while said second extension member is in a first position and to maintain engagement with said bolt member when said second extension member is pivoted out of said first position.

4,624,493

SELF-RESTORING ENERGY ABSORBING BUMPER MOUNT

Donald G. Hillebrand, Lake Orion, and Donald A. Mugford, East Detroit, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 30, 1985, Ser. No. 781,365
Int. Cl.[4] B60R *19/02*
U.S. Cl. 293—136 **5 Claims**



1. An energy-absorbing mount for mounting a bumper assembly to a support frame of an automobile comprising;

a longitudinally extending vehicle frame portion formed with an inner wall having a circular opening with its center aligned on a longitudinal axis;

a longitudinally extending tubular member having its forward portion adapted to be secured to a vehicle bumper assembly and its aft portion adapted to be slidably supported in said inner wall circular opening with said tubular member aligned on said axis;

said frame portion having intermediate wall means defining

an aperture receiving an intermediate portion of said tubular member therethrough;

abutment means on said tubular member adapted to engage said intermediate wall means preventing forward travel of said tubular member;

a cylindrical capsule of compressible thermoplastic polyester elastomer material having a central passage telescopically receiving said tubular member aft portion therethrough, said capsule having its aft end adapted to abut said inner wall and extending forwardly so as to be axially spaced a predetermined distance from said abutment means;

coil compression spring means concentrically disposed about said tubular member intermediate the forward end of said capsule and said abutment means, said spring means exerting an axially compressive preload force biasing said bumper assembly into its outboard pre-impact position,

said frame portion including longitudinally extending wall means defining a chamber adapted to surround said capsule in a symmetrical manner, said chamber wall means spaced from the outer periphery of said capsule so as to restrict the radial expansion of said capsule to a predetermined minimal radial distance,

whereby in response to the application of a predetermined impact load on said bumper causing said capsule to elastically and plastically deform in a radially outward geometric manner such that upon contacting said chamber wall means a permanent corrugated-like undulation is formed thereby dissipating the impact energy, and wherein said capsule being permanently reduced in its overall axial dimension as a result of said undulation such that said spring means expands to accommodate said reduced axial dimension thereby biasing said bumper to its original pre-impact position.

4,624,494

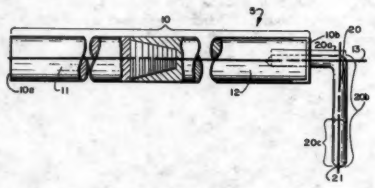
TOOL FOR REMOVING ITEMS FROM A COVERED TRUCK BED

Raymond H. Huppert, Rte. 1, Box 74, Ellsworth, Wis. 54011

Filed Jul. 16, 1985, Ser. No. 755,694

Int. Cl.[4] B25J *1/04*

U.S. Cl. 294—26 **4 Claims**



1. A tool for retrieving items from a covered truck bed having rounded grooves comprising:

(a) a cylindrical elongated handle about 5 feet to 6 feet long and about 1 inch to 1.5 inches in diameter; the handle having a longitudinal axis, a first end and a second end; the handle comprising two handle-sections of substantially equal length which are screwed together and may be repeatedly engaged and disengaged;

(b) a metal rod extending from the second end of the handle, the metal rod comprising:

(i) an attachment portion embedded into the handle;

(ii) an extension portion having a longitudinal axis, the extension portion integrally coupled with the attachment portion and extending substantially perpendicular to the longitudinal axis of the handle; and

(iii) a hooked portion integrally coupled with the extension portion, the hooked portion forming a rounded hook which defines a plane substantially perpendicular to a plane passing through the longitudinal axis of the handle and the longitudinal axis of the extension portion, the rounded hook substantially conforming in size and shape to a cross-sectional portion of a rounded truck bed groove whereby the hooked portion can rest snuggly within the truck bed grooves; and

(c) a metallic cap over the second end of the handle, the metallic cap securely coupled with the handle and welded to the metal rod.

4,624,495

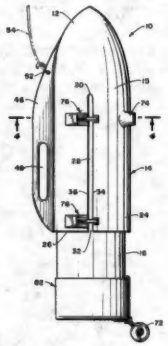
TANK AND VALVE COVER WITH TRANSPORTING ASSEMBLY

Gary L. Marsh, 3501 Bernard St., 1-A, Bakersfield, Calif. 93306

Filed May 9, 1985, Ser. No. 732,068

Int. Cl.[4] B65D *87/06, 61/00*

U.S. Cl. 294—31.2 **21 Claims**



1. A cover for a cylindrical portable compressed gas tank having a valve assembly at a top end thereof comprising:

a head portion for enclosing the valve assembly from which extends an annular sleeve for encircling at least the upper portion of said tank;

an elongated slot through said sleeve extending longitudinally from the bottom edge thereof;

a locking means mounted upon said sleeve for securing the sleeve in frictional engagement with the upper portion of said tank to be contained therein comprising a contracting mechanism for reducing the distance between opposing sides of said slot including a first pivot means mounted on said sleeve proximate the lower portion thereof adjacent a side of said slot and a second pivot means mounted on said sleeve across said slot from said first pivot means, said sleeve including a concentric reinforcing band having a first end connected to said first pivot means and a second end connected to said second pivot means;

a rotatable draw member attached to said first pivot means having an abutment part with an opening therethrough; and,

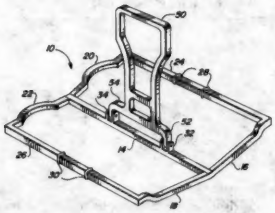
a rotatable rod member attached to said second pivot means having a free end that extends across the slot and through said opening, said rod member including an adjustment means on said free end for engagement with the abutment part when said draw member and rod member are rotated to a lock position.

4,624,496

BOOT CARRIER FRAME

Rodney L. Bengtson, 7549 E. Irvington, Tucson, Ariz. 85730

Filed Jul. 2, 1985, Ser. No. 751,234
Int. Cl.[4] A47F *7/08*; B65D *63/18*
U.S. Cl. 294—148 10 Claims



1. A ski boot carrier frame for securing a pair of ski boots for transportation and storage comprising:

a pair of side by side openings defined by a central side member common to both openings, a second and third side member parallel to and disposed on opposite sides of said central side member, a first and second front strut member, said first front strut member connecting said central side member to said second side member and said second front strut member connecting said central side member to said third side member, said first and second front strut members angled towards each other, and a first and second rear strut member, said first rear strut member connecting said central side member to said second side member and said second rear strut member connecting said central side member to said third side member, said first and second rear strut members angled towards each other; and

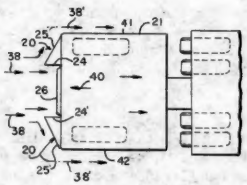
a handle operably attached to said central side member whereby when each of the ski boots of the pair is placed in one of the side by side openings to be secured for transportation and storage, the ski boots are inclined towards each other.

4,624,497

TRUCK AIR DEFLECTOR

Robert L. Tassin, 3305 Cherry La. #13, Fargo, N. Dak. 58102

Filed Jun. 17, 1985, Ser. No. 745,606
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S 3 Claims



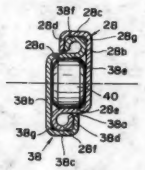
2. An air deflection apparatus for attachment to a truck having a substantially vertical flat front face with a radiator grill mounted centrally on the front face, a pair of vertically elongated front panels on each side of said radiator grill, each of said elongated panels being movably mounted to one another along one of their longitudinal edges and movably mounted along their other longitudinal edges to the front face whereby they may be moved to a forward extending position to extend forward from the grill on each side thereof to form separate vertical ridges along vertical axes where the two panels are movably mounted together with the panels diverging rearwardly therefrom and with one of the panels of each pair extending rearwardly and laterally outward from their vertical axis to provide a tapered surface and with its tapered surface providing reduced air resistance to the forward movement of the truck in comparison to the front face, and with the other of said panels on each respective side of the grill diverging rearward with its movable mounting on said front face being adjacent their respective outer edge of the grill.

4,624,498

SEAT SLIDING DEVICE OF A VEHICLE

Hideyuki Nagashima, and Kouzo Maeda, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 454,548, Dec. 30, 1982, abandoned.
This application May 16, 1985, Ser. No. 734,820
Claims priority, application Japan, Jan. 21, 1982, 57-6601[U]
Int. Cl.[4] B60N *1/08*
U.S. Cl. 296—65 R 6 Claims



1. A seat sliding device of a vehicle, comprising:

an elongate stationary rail secured to a floor of said vehicle and having a channel-shaped longitudinal guiding member, a curl-shaped longitudinal guided member, and a longitudinal main section transversely interposed between and connecting said guided member and said guiding member, the guided member projecting downwardly from the main section through an angle of at least 270 degrees;

an elongate movable rail connected to a seat in said vehicle to move therewith, said movable rail having, throughout the length thereof, a cross section identical to that of said stationary rail and so having a longitudinal guiding member, a longitudinal guided member, and a longitudinal main section transversely interposed between and connecting said guided member and said guiding member, and being slidably engaged with said stationary rail in such a manner that said guided and guiding members of said stationary rail are engaged with the corresponding guiding and guided members, respectively, of said movable rail in a mutually inverted relationship, said guided members being respectively received within and contacting inner surfaces of said guiding members; and

a plurality of rollers disposed within a longitudinal channel formed by opposed interior faces of said main sections and opposed interior faces of said guided members;

wherein during off axial loading of said rollers, each of said guided members engages with the respective guiding member in a manner to minimize frictional interaction while providing minimal clearance.

4,624,499

VISOR WITH PIVOTED CONCEALED VANITY MIRROR

Carl W. Flowerday, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Apr. 1, 1985, Ser. No. 718,716
Int. Cl.[4] B60J *3/00*
U.S. Cl. 296—97 H 23 Claims

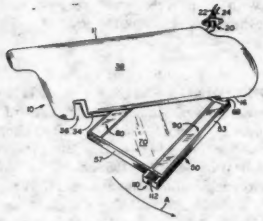
1. A vehicle visor comprising:

a visor body defining a recess with at least an open edge at the lower edge of said visor body for access to said recess;

a generally rectangular mirror panel having a mirror on one

side, said panel shaped to fit within said recess and said panel including pivot means at one corner; and

means for coupling said pivot means of said panel to said visor body with said corner adjacent said open edge for



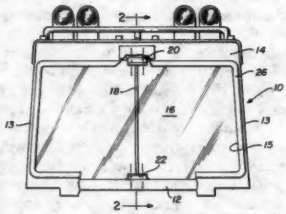
pivotal movement in a plane parallel to the plane of said visor body and between a stored position within said recess and a use position lowered below said visor body with the major axis of said mirror extending in a generally vertical direction.

4,624,500

ASSEMBLY FOR DAMPENING VIBRATION OF A GLASS PANEL IN A VEHICLE

Theodore A. Heitman, Libertyville, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 30, 1985, Ser. No. 739,340
Int. Cl.[4] B60J *1/00*
U.S. Cl. 296—146 **5 Claims**



1. In an assembly for dampening vibration of a glass panel in a vehicle window opening bordered by vehicle body panels, said glass panel having a vertical axis, a horizontal axis, a top edge, a bottom edge, and a pair of opposed side edges, first support means connected to the vehicle body and the top edge of the glass panel, and second support means connected to the vehicle and the bottom edge of the glass panel, wherein the improvement comprises:

a rigid support member disposed adjacent an inside surface of said glass panel substantially parallel to the vertical axis thereof;

a first bracket assembly joined to an upper inside panel of said vehicle body, and to an upper surface of said support member;

a second bracket assembly joined to a lower inside panel of said vehicle body and to a lower surface of said support member; and

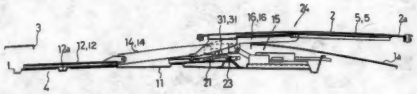
resilient joining means disposed between the contiguous surfaces of said support member and said glass panel for preventing the glass panel from being excited to vibration amplitudes and frequencies which cause the glass panel to shatter.

4,624,501

SLIDING ROOF DEVICE FOR AUTOMOBILES

Toshiaki Niwa, Asaka, and Yukichi Inada, Yotsukaichi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 621,111
Claims priority, application Japan, Jun. 22, 1983, 58-96460[U]
Int. Cl.[4] B60J *7/047*
U.S. Cl. 296—222 **6 Claims**



5. A sliding roof device for a vehicle having a roof with an opening being disposed therein comprising:

a sliding roof operatively positioned to close the opening in the roof of the vehicle, said sliding roof including a front surface, a rear surface, an upper face and a lower face;

a roof frame;

tilt-up means for tilting the rear surface of said sliding roof;

frame side guide rails including main guide rails and sub guide rails mounted on said roof frame;

said main guide rails having a first end and a second end, said first end being positioned at a lower elevation relative to said second end in relation to the roof opening, said sub guide rails being adapted to be rearwardly tilted upward, front and rear slide stays mounted on the lower face and both sides of said sliding roof;

said front slide stays being guided along said main guide rails;

said rear slide stays being guided along said sub guide rails and being inclined at an angle to be rearwardly elevated when the sliding roof is in the tilted position in such a manner that the rearward displacement of the sliding roof causes the inclination angle of the rear slide stays to decrease;

moving members attached to said front and rear slide stays and operatively positioned to be movable back and forth along said frame side guide rails wherein upwardly tilting the rear surface of said sliding roof and displacing said sliding roof to a roof back position with said moving members being guided and elevated along said frame side guide rails varies the angle of inclination of said sliding roof relative to said opening in the roof of the vehicle while displacing the rear surface of the sliding roof downwardly; and

an elastic member operatively positioned between said sliding roof and said roof frame and being adapted to be compressed by said sliding roof when said roof is fully opened to push and bias said slding roof upwardly.

4,624,502

PORTABLE DRAWER ASSEMBLY

Leon J. Boole, P.O. Box 31, Newtonville, Mass. 02160

Filed Nov. 21, 1984, Ser. No. 673,669
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—192 **3 Claims**

1. A portable drawer assembly for use with a four-legged piece of furniture having a space between the legs, such as a chair or the like, said assembly comprising:

an enclosure having a drawer and cover therefor,

means for selectively adjusting the width of each of said drawer and cover to effect the positioning thereof in the space between the four legs,

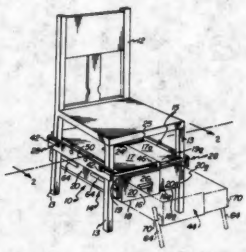
said drawer including

first and second unitary sections each having a rectangular base and three side walls perpendicular thereto, said selective adjusting means including

an integral slot in the base and two side walls of said first section along the open side thereof, the base and two side walls of said second section at the open side thereof being configured to be entirely slidably received in said integral slot;

said cover including first and second unitary sections each having a rectangular top portion and a vertical portion perpendicular to said top portion, said portions configured to form an L;

said selective adjustment means including an integral slot in the top portion of said first section slidably receiving the top portion of said second section;



means for removably mounting the cover in suspension from the four legs comprising clamping members for connecting said cover to the four legs, said clamping members including

an elongated slat abutting the vertical portion of each of said cover sections and fixed thereto by flexible strand means, and

spring means fixed to the top portion of each cover section received on said strand means for biasing a slat towards the vertical leg of each section of said cover; and

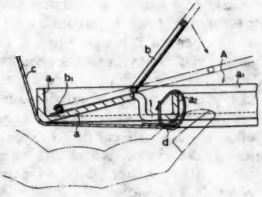
means for mounting the drawer in suspension from said cover from sliding movement into and out of said space relative to said cover between the four legs.

4,624,503

FRAME FOR A VEHICLE SEAT

Hashimoto Kazunori, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd., Japan

Filed Jan. 29, 1985, Ser. No. 695,902
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—452 **3 Claims**



1. A frame for use in the bottom of a vehicle seat, comprising:

a main body formed of a band-like metal plate, said main body having an upper surface facing inwardly from the bottom of said vehicle seat, an outer edge of the plate extending along the longitudinal direction as well as outwardly thereof and an inner edge of the plate extending along the longitudinal direction of the plate;

an upwardly bent portion extending upwardly from said outer edge of said main body in a direction vertical to said main body;

a reinforcing portion having a substantially U-shaped configuration in section, said reinforcing portion being formed with one leg of the U-shaped portion comprising the inner edge of said main body;

an inclined portion defined between said upwardly bent portion and the other leg of the U-shaped said reinforcing portion, said inclined portion being so sloped that it becomes higher from a lower portion of said upwardly bent portion up to an upper end of said reinforcing portion in such a manner that the inclined portion as a whole extends higher in a direction inwardly of said main body; and

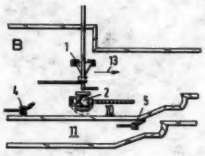
a plurality of cushioning springs fixedly secured at their respective ends to said upper surface of said main body.

4,624,504

METHOD OF EXCAVATING OVERBURDEN IN SURFACE MINING OPERATIONS

Rüdiger Franke, Mettmann; Aby Weiss, Monheim; Hans Goergen, Cologne; Christian Niemann-Delius, Aachen, all of Fed. Rep. of Germany, and Frank Kay, Houston, Tex., assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,706
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306828
Int. Cl.[4] E21C 41/00
U.S. Cl. 299—18 **6 Claims**



1. In a method of exposing minerals in surface mining operations such as where large depths of overburden are present over the minerals and where the mining operation is carried out by means of excavating machines operating at one or more levels in an elongated pit having a highwall side and a dump side spaced laterally from one another comprising the steps of excavating the overburden and depositing the excavated overburden along the dump side using a cross-pit transporter and using at least a first excavating machine for excavating one or more upper layers of overburden on the highwall side and using the cross-pit transporter for conveying the excavated overburden across the pit and onto the dump side, and using a second excavating machine travelling at a level not higher than the level of the cross-pit transporter and excavating one or more overburden layers deeper than excavated by the combination of the at least one first excavating machine and the cross-pit transporter and directly depositing the excavated overburden from the second excavating machine onto the dump side, wherein the improvement comprises when the cross-pit transporter in a first excavating position and the second excavating machine in a second excavating position travelling on the same level within the pit meet and interfere with the continued movement of one another with the cross-pit transporter travel path located between the second excavating unit travel path and the highwall side, moving the second excavating machine from the second excavating position thereof across the pit to a third waiting position in an area between the highwall side and the cross-pit transporter travel path, moving the cross-pit transporter in the elongated direction of the pit past the second excavating machine to a position where it no longer interferes with the movement of the second excavating machine, returning the second excavating machine to the second excavating position where previously the second excavating machine and cross-pit transporter had interfered with the movement of one another and continuing the overbur-

den excavating operations, with said cross-pit transporter and said second excavating machine travelling on the same level in opposite directions and meeting with the cross-pit transporter in the first position and the second excavating machine in the second position, reversing the travel direction of said cross-pit transporter together with the first excavating machines and excavating a space in the highwall side bordering the level on which the second excavating machine and the cross-pit transporter are travelling and then moving the second excavating machine from the second position into the excavated space into the third waiting position and reversing the direction of the cross-pit transporter to its original direction of travel and moving the cross-pit transporter past the second excavating machine in the third waiting position, and then returning the second excavating machine from the excavated space to the second excavating position thereof.

4,624,505

MINERAL CUTTER PICKS AND PICK ASSEMBLIES

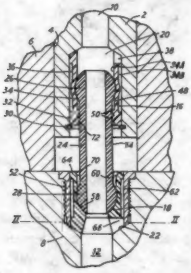
Peter Stevens, Coventry, United Kingdom, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Jan. 15, 1985, Ser. No. 691,646

Claims priority, application United Kingdom, Jan. 19, 1984, 8401403

Int. Cl.[4] E21C *35/22*; E21F *5/02*

U.S. Cl. 299—81 **6 Claims**



1. A pick assembly comprising a cutter pick and a holder having an aperture in which a shank of the pick is received, first and second passages being provided in said holder and pick, respectively, conducting fluid to an opening adjacent a cutting tip of the pick, a fluid connector extending longitudinally between said holder and pick for conducting fluid therebetween while permitting relative longitudinal and lateral movement therebetween, said connector comprising a hollow tubular element extending longitudinally between said first and second passages for conducting fluid therebetween, said tubular element having an intermediate portion and first and second enlarged portions at the ends thereof, first and second sealing means disposed in said first and second passages, respectively, each of said sealing means comprising a sleeve having end portions engaging a wall of the respective passage and a resilient wall extending between said end portions, said wall surrounding a respective one of said first and second enlarged portions and including an inner face engaging the respective enlarged portion, and an outer face spaced radially inwardly with respect to a wall of the respective passage to form an annular space circumferentially surrounding the respective enlarged portion to permit relative lateral movement between said pick and holder, said annular space having a larger dimension in the longitudinal direction than the respective enlarged portion, said annular space being exposed to the pressure of fluid in the respective passage for biasing said inner face against the respective enlarged portion.

4,624,506

COMPOUND ELECTROPNEUMATIC BRAKE CONTROL SYSTEM

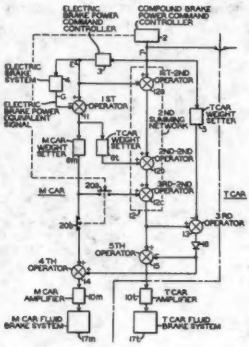
Shigeaki Doto, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Jun. 26, 1985, Ser. No. 748,782

Claims priority, application Japan, Jun. 28, 1984, 59-134400

Int. Cl.[4] B60T *13/68*

U.S. Cl. 303—3 **6 Claims**



1. A compound electropneumatic brake control system for a train having powered motor M cars and nonpowered trailer T cars comprising, a compound brake power command controller for conveying a compound brake power command signal to an electric brake command controller and to a first-second summing operator, said electric brake command controller conveys an electric brake command signal to an electric brake system, to a first summing operator, and to said first-second summing operator, said electric brake system conveys an electric brake power equivalent signal to said first summing operator, said first summing operator is coupled to an M car weight setter and to a T car weight setter, said M car weight setter is connectable by a first switch to a third-summing operator and is connectable by a second switch to a fourth summing operator, a second-second summing operator is coupled to said third-second summing operator, said third-second summing operator is coupled to a third and a fifth summing operator, said compound brake power command signal is conveyed to another T car weight setter which is coupled to said third summing operator, said third summing operator is coupled to said fourth and said fifth summing operator, said fourth summing operator is coupled to an M car fluid brake system, and said fifth summing operator is coupled to a T car fluid brake system wherein any deficiency in the electric brake system is supplemented by said M car and T car fluid brake system when said compound brake power command signal is less than the maximum adhesion brake power equivalent signal and to supplement the deficiency in said T car fluid brake system prior to said M car fluid brake system when said compound brake power command signal is greater than the maximum adhesion brake power equivalent signal.

4,624,507

SAFETY DEVICE ON A BRAKING CORRECTOR

Jean-Jacques Carre, Le Raincy, and Jean-Marc Cheron, Longperrier, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Mar. 18, 1985, Ser. No. 713,227

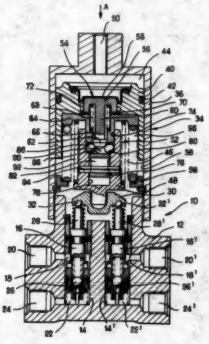
Claims priority, application France, Mar. 28, 1984, 84 04842

Int. Cl.[4] B60T *8/26*

U.S. Cl. 303—6 C **10 Claims**

1. A braking corrector capable of being interposed between a source of hydraulic pressure and a motor vehicle braking

circuit, of the type incorporating a casing provided with at least one bore, a differential hydraulic piston sliding in the bore and defining a first pusher chamber and a second pusher chamber capable of being joined to the source of hydraulic pressure and to the braking circuit, respectively, the piston controlling flow of fluid under pressure between the chambers, a control device capable of generating a pilot force on the hydraulic piston so as to push the hydraulic piston in a direction in which the flow of fluid is established, the fluid under pressure generating a reaction force pushing the piston in a direction in which the flow of fluid is interrupted, characterized in that the control device includes a monitoring device for monitoring the pilot force and which is capable of limiting the pilot force when the reaction force exceeds the pilot force by a predetermined amount, the monitoring device interposed between a pilot push rod of the control device and the hydraulic piston,



the monitoring device including a plunger held in an operative position when the pilot force exceeds the reaction force increased by a predetermined value and ensuring a mechanical link between the control device and the hydraulic piston, the plunger being capable of occupying a non-operative position when the reaction force exceeds the pilot force increased by the predetermined amount to eliminate the mechanical link between the control device and the hydraulic piston, the plunger further including a conical end separating, in the operative position, two locking components which, by cooperating with a second push rod associated with the hydraulic piston, transmit the pilot force to the hydraulic piston, the two locking components being capable of causing the plunger to occupy the non-operative position when the force on the plunger generated by the reaction force exceeds the pilot force increased by the predetermined amount.

4,624,508

REGULATOR VALVE FOR HYDRAULIC ANTI-SKID APPARATUS

Yoshiharu Adachi; Asao Kozakai, both of Kariya; Shingo Watanabe, Toyota; Nobuyasu Nakanishi, Toyota; Hiroyuki Oka, Toyota, and Fumio Nakagawa, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 6, 1984, Ser. No. 637,719

Claims priority, application Japan, Aug. 4, 1983, 58-121551[U]

Int. Cl.[4] B60T *8/02*

U.S. Cl. 303—116 **4 Claims**

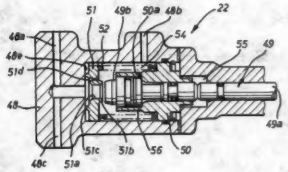
1. A regulator valve for a hydraulic anti-skid apparatus for installation in a vehicle braking system between a master cylinder and a wheel brake cylinder, the regulator valve comprising:

a housing provided with a first inlet port for connection to a hydraulic power pressure source and said anti-skid apparatus, a second inlet port for connection to said master cylinder, and an outlet port for connection to a fluid reservoir;

a regulator piston reciprocably disposed within an axial bore in said housing to subdivide the interior of said housing into first and second fluid chambers, said first fluid chamber being in open communication with said first inlet and outlet ports, said second fluid chamber being in open communication with said second inlet port, and said regulator piston being formed at one end thereof with a valve part exposed in said first fluid chamber; and

valve seat means arranged within said first fluid chamber between said first inlet and outlet ports to cooperate with the valve part of said regulator piston so as to control the flow of pressurized fluid from said first inlet port to said outlet port in response to the difference in pressure between said first and second fluid chambers;

wherein a support member is arranged in place within said first fluid chamber and formed therein with an axial bore



in which the one end portion of said regulator piston is axially slidably disposed in a fluid-tight manner to form a third annular fluid chamber, said support member being further formed with an orifice for a fluid communication between said first and third fluid chambers, whereby the capacity of said third annular fluid chamber is increased or decreased in response to movement of said regulator piston to restrain vibration of said regulator piston, wherein the axial bore in said support member is in the form of a stepped bore, and said regulator piston comprises a stepped piston axially slidably disposed in a fluid-tight manner within the stepped bore in said support member and having a large diameter portion exposed in said first fluid chamber at its one end face, and wherein said third annular fluid chamber comprises an annular fluid chamber formed by a large diameter portion of said stepped piston in a large diameter portion of the stepped bore in said support member.

4,624,509

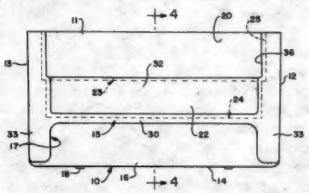
STORAGE DRAWER

Roger H. Ramsey, Wadsworth, Ohio, assignor to Myers Industries, Akron, Ohio

Filed Oct. 11, 1983, Ser. No. 540,333

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—234.5 **1 Claim**



1. A storage bin drawer including a plurality of walls including a front wall forming a storage compartment, said front wall

having opposed edge portions and a continuous center panel extending between lower parts of said edge portions;

offset upper window and lower label slots formed in said front wall,

said slots being open at their tops and offset longitudinally of the drawer, said window slot being longer than said label slot, and being of U-shape;

a part of said front wall forming a backing panel for said label slot; and

protruding nubs formed on walls of said U-shaped slot to assist in retaining a transparent panel in said slot;

a handle means formed on a lower portion of said front wall for slidably removing the drawer from a storage position,

the handle means including an undercut which is formed in a lower portion of the front wall and by a portion of a bottom of the drawer.

4,624,510

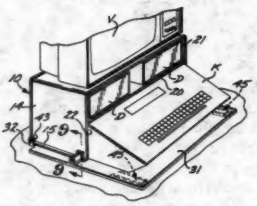
STORAGE ASSEMBLY FOR DATA PROCESSING DEVICE

Francis J. Jedziniak, 2352 W. 227th St., Torrance, Calif. 90501

Continuation-in-part of Ser. No. 340,115, Jan. 18, 1982, Pat. No. 4,493,267. This application Jan. 17, 1985, Ser. No. 692,910

Int. Cl.[4] A47B *49/00*

U.S. Cl. 312—252 **2 Claims**



1. A storage system for storing a complement of data processing devices, comprising:

a support plate conformed for attachment to a work surface;

a lower rectangular housing attached to said support plate, said lower housing including a front opening and a slide extendable from the interior thereof through said front opening;

an upper rectangular housing mounted on said lower housing;

a lock strip selectively engageable in said front opening;

a rear cover selectively securable to said upper and lower housing; and

a turntable mounted on said upper housing including a resilient pad compressed between the adjacent surfaces of said turntable and said upper housing for producing friction.

4,624,511

STABILIZER LEG INTERLOCK

William J. Oehme, Boca Raton, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 24, 1985, Ser. No. 747,633

Int. Cl.[4] A47B *81/00*

U.S. Cl. 312—273 **10 Claims**

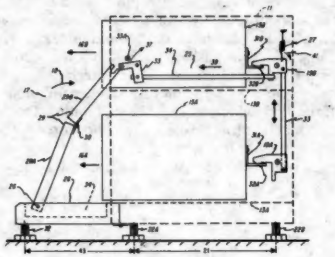
1. Stabilizer leg interlock means for preventing the withdrawal of an insertable device within a cabinet until a cabinet stabilizing leg is placed in an extended and locked support position comprising:

(a) a cabinet having a plurality of receiving means for the insertion and withdrawal of removable devices;

(b) locking means for engagement with one or more of said removable devices and preventing the withdrawal of respective ones of said removable devices;

(c) said cabinet having a base area and being supported on said base;

(d) a cabinet stabilizer leg mounted in said cabinet for extension into an operative position for supporting said cabinet from a first location outside said base;



(e) interlock means for engagement with said cabinet support means and said locking means to disengage said locking means from their respective devices for withdrawal from said cabinet; and

(f) said interlock means, when engaged with said stabilizer leg cabinet support in its said operative position, disengaging said locking means.

4,624,512

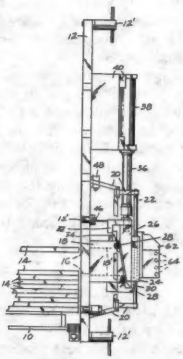
PROCESSING CABINET WITH SUB-DOOR ACCESS

John M. Fay, Warminster, Pa., assignor to Hull Corporation, Hatboro, Pa.

Filed Jun. 10, 1985, Ser. No. 743,062

Int. Cl.[4] A47B *57/06*

U.S. Cl. 312—292 **6 Claims**



1. In combination, a cabinet having a main closure door,

(a) an access sub-opening in the main door configured to permit access to the interior of the cabinet through the main door when the latter is closed,

(b) an entry chamber mounted on the outside of the main door and surrounding the sub-opening, forming an entry passageway registering with the sub-opening and having a sloping outer face,

(c) a sub-door mounted on and spaced outwardly from the main door for movement across the outer face of the entry chamber to open and close said sub-opening,

(d) sealing means interposed between the entry chamber and sub-door and comprising a resilient seal surrounding said entry chamber sloping outer face, the sub-door having a

sloping face arranged to abut the resilient seal and form a pressure tight seal therewith when the sub-door is in closed position, and

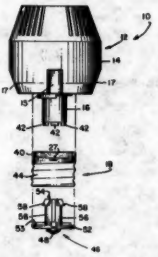
(e) power means interengaging the main door and sub-door and operative to move the sub-door relative to the entry chamber to open and close the access sub-opening.

4,624,513

LAMP HOLDER ASSEMBLY HAVING ROTATABLE BASE SHELL

Thomas Haraden, Ipswich, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 12, 1985, Ser. No. 722,946
Int. Cl.⁴ H01R *39/00*
U.S. Cl. 339—1 L **20 Claims**



1. A lamp holder assembly comprising:

a first housing having a central body portion and a protruding portion located at one end of said first housing:

a base shell surrounding said protruding portion of said first housing;

a retainer member secured to said protruding portion of said first housing; and

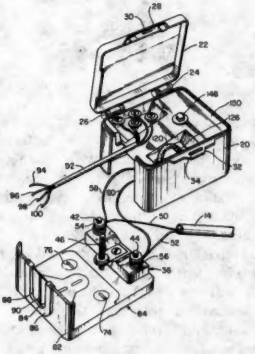
means for permitting a predetermined amount of rotational movement of said base shell relative to said protruding portion and said retainer member.

4,624,514

STATION INTERFACE AND PROTECTOR APPARATUS

Thomas J. Smith, Bay Shore, N.Y., assignor to TII Industries, Inc., Copiague, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,360
Int. Cl.⁴ H01R *4/66*
U.S. Cl. 379—412 **6 Claims**



1. A station interface and protector apparatus for use on an incoming telephone line pair connected to a subscriber's telephone line pair, comprises in combination:

A. protector means including;

(i) a pair of terminals adapted to receive thereon said incoming telephone line pair,

(ii) a ground terminal adapted to receive thereon a ground wire,

(iii) an overvoltage protection device connected between each said line terminals and said ground terminal, and

(iv) insulated base means having means for mounting to a surface and adapted to receive said overvoltage protection device said ground terminal being affixed in said base means; and

B. cover means for covering said base means and said protector means, said cover means including;

(i) receptacle means of the type adapted to receive a plug disposed on the distal end of a plug-in telephone line cord and having at least two terminals,

(ii) connection means for electrically connecting said receptacle terminals to said line terminals,

(iii) at least two station terminals disposed in said cover means, said station terminals being adapted to receive said subscriber telephone line pair,

(iv) cable connection means having a plurality of wires therein, one end of each of said wires being connected to each of said station terminals, the other distal ends of said wires being terminated in a plug similar to said plug disposed on the distal end of said plug-in telephone line cord so that when either of said plugs is placed in said receptacle said telephone line pair is continued,

(v) attaching means cooperating with said ground terminal for removably attaching said cover means to said protector means and completely covering said base means,

(vi) hinge means disposed on one edge of said cover means; and

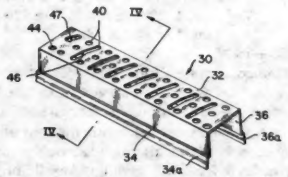
C. cap means having means for cooperating with said cover hinge means for covering said complete cover.

4,624,515

ELECTRICAL CONNECTOR WITH GROUNDING CLIP

Robert W. Brush, Jr., North Brunswick, and Robert M. Scharf, Bedminster, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Apr. 17, 1985, Ser. No. 724,237
Int. Cl.⁴ H01R *4/66*
U.S. Cl. 339—14 R **9 Claims**



1. An electrical connector assembly for terminating electrical cable having a plurality of conductors and an outer insulative jacket, said assembly comprising:

an insulative housing for supporting said cable;

a plurality of electrical contacts supported in said housing for electrical engagement with said conductors of said cable;

a conductive shell supporting said housing; and

a conductive element having a first portion supported on said housing in alignment with said electrical contacts, said first portion having first openings dimensioned for accommodating therethrough selected ones of said contacts by friction fit such that said selected contacts

electrically engage said first portion and second openings dimensioned for accommodating contacts other than said selected contacts such that said other contacts are electrically isolated from said first portion and a second portion electrically connected to said conductive shell providing electrical continuity between said selected contacts and said conductive shell.

4,624,516

ELECTRICAL JUNCTION HOUSINGS

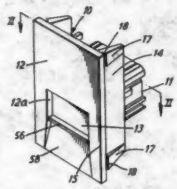
Rowland S. White, Canterbury, England, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 28, 1985, Ser. No. 716,903

Claims priority, application United Kingdom, Mar. 29, 1984, 8408097

Int. Cl.⁴ H01R *13/44*

U.S. Cl. 339—40 **16 Claims**



1. A fascia assembly for an electrical junction housing which assembly comprises a fascia having a front face, a rear face and an aperture extending between said faces and a connection module having a front plate carrying resilient location means co-operating with the edges of the aperture to releasably locate the module in the aperture, the fascia having a formation in contact with the rear face and extending around the aperture against which the rear of the front plate bears such that the front face of the front plate is flush with the front face of the fascia.

4,624,517

LOW INSERTION FORCE CONNECTOR SYSTEM

John W. Anhalt, Orange, and David S. Goodman, Mission Viejo, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,420

Int. Cl.⁴ H01R *13/629*

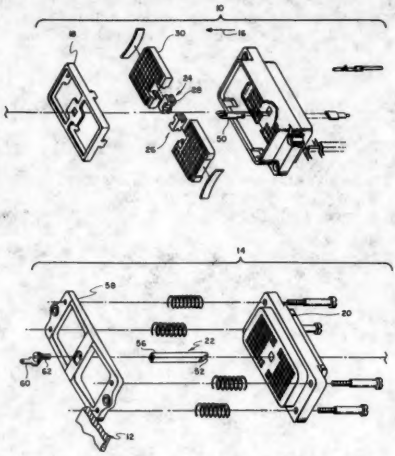
U.S. Cl. 339—75 M **4 Claims**

1. In a connector system for making contact between terminals of an inplace assembly that lies within a housing and terminals of an insertable assembly that can slide in an insertion direction into and in an opposite direction out of the housing, wherein most of the terminals on one assembly are main terminals to be deflected sidewardly after they lie opposite corresponding main terminals on the other assembly, and wherein each assembly has a first make/last break auxilliary terminal that makes contact prior to the making and breaks contact after the breaking of the main terminals, the improvement wherein:

said insertable assembly includes a deflection device which is movable largely perpendicular to said insertion direction to deflect a plurality of main terminals sidewardly, and said deflection device including a cam follower;

said housing includes a cam device having an end positioned to engage said cam follower of said deflection device to move said deflection device sidewardly as the insertable assembly moves in said insertion direction;

said cam device includes a first of said auxilliary terminals, and the other second one of said auxiliary terminals is mounted on the insertable assembly at a location to engage the first auxilliary terminal prior to movement of said



deflection member far enough to deflect the main terminals against other main terminals.

4,624,518

ELECTRICAL CONNECTOR

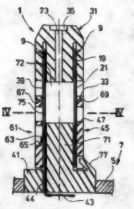
Udo Seidel, Hamburg, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 26, 1985, Ser. No. 780,220

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3437829

Int. Cl.⁴ H01R *4/24*

U.S. Cl. 339—97 P **9 Claims**



1. An electrical connector comprising:

a hollow-cylindrical, electrically conductive contact element having a pair of parallel wire connection slots extending in a circumferential direction, each wire connection slot extending from a relatively wide insertion area to a narrow insulation cutting and wire core connection clamping area,

a cap of an electrically insulating material over said contact element having a first transverse channel in axial alignment with a first of said wire connection slots in said contact element for receiving the end of an insulated electrical wire, said cap being rotatable about said contact element between an insertion position and a wire connection position whereby the first transverse channel is aligned with either the wire insertion area or the clamping area of said first wire connection slot,

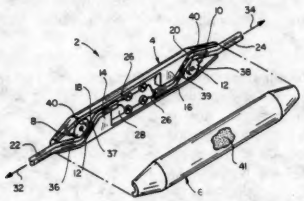
a tubular sleeve of an insulating material fitted on said contact element and having a second transverse channel in axial alignment with the second of said wire connection slots in said contact element for receiving the end of an insulated electrical wire, said tubular sleeve being rotatable about said contact element between an insertion position and a wire connection position whereby the second transverse channel is aligned with either the wire insertion area or the clamping area of said second wire connection slot, and

a locking mechanism for locking said tubular sleeve in its wire connection position.

4,624,519
DROP-WIRE CLOSURE HAVING INSULATION-PIERCING MEANS

Alvah A. Lawrence, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 6, 1985, Ser. No. 698,646
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 P **6 Claims**



1. A connector comprising:

a single pivoted cam means having first and second cam surfaces;

means confronting the cam means and cooperating therewith to define first and second variable-sized passageways, a first cable being inserted through the first passageway and a second cable being inserted through the second passageway;

insulation-piercing means disposed on each of the first and second cam surfaces;

the cam means being pivoted and oriented so as to decrease a size of the first and second variable-sized passageways, respectively, in response to pull-out forces exerted on either of the first and second cables;

the insulation-piercing means piercing each of the first and second cables and making electrical contact therebetween; and

further comprising first and second wedge-shaped members disposed within wedge-shaped sections of the first and second passageways, and first and second means for biasing the first and second wedge-shaped members towards an apex line of the first and second passageways.

4,624,520
COAXIAL CABLE CLAMP

Kenneth P. Blum, Middlesex County, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

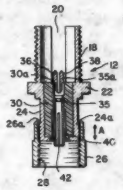
Filed Apr. 8, 1985, Ser. No. 720,647
Int. Cl.[4] H01R *11/20*
U.S. Cl. 339—97 R **19 Claims**

1. A connector for electrical cable having an elongate insulated conductor and a drain wire conductor, said connector comprising:

an elongate conductive housing for accommodating said insulated conductor and said drain wire;

an electrical contact supported in and electrically isolated from said housing, said contact having a first insulation displacing end portion for electrical and mechanical engagement with said insulated conductor and a second opposed end portion extending exteriorly of said housing;

a conductive clamping element movably supported on said housing for contacting said insulated conductor and movable to urge said insulated conductor into insulation displacing connection with said first end portion of said



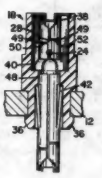
contact, said clamping element including means for mechanically and electrically supporting said drain wire; and

securement means for providing said clamping element movement; said urging means further urging said drain wire into said mechanical and electrical connection with said clamping element.

4,624,521
ELECTRICAL CONNECTOR AND METHOD

Vasantrai A. Vachhani, Eden Prairie, Minn., assignor to ADC Telecommunications, Minneapolis, Minn.

Filed Feb. 26, 1985, Ser. No. 705,902
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 P **8 Claims**



1. An insulation displacement connector, comprising:

(a) an elongated conductive element, the element having a generally circular cross-section;

(b) an open seam extending along the length of the element, the seam having a width sized to accept a conductor of predetermined cross-sectional range;

(c) a pair of slots, each of the slots extending generally parallel to the seam, each slot spaced inward from the seam on opposite sides thereof; and,

(d) first and second cuts in the element generally extending about segments of its circumference, each cut extending between an associated slot and the seam, with the first and second cuts displaced from one another along the length of the element such that pairs of opposed, staggered beam segments are formed, each being active along a different portion of the cylinder length.

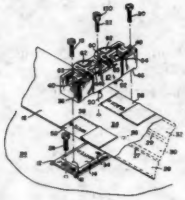
4,624,522
RECEPTACLE FOR FLAT MULTICONDUCTOR CABLE

William S. Greenwood, Nutley; Karl Weinmann, Watchung, and Reinhold Weindel, Clinton, all of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Continuation of Ser. No. 337,661, Jan. 7, 1982, Pat. No. 4,479,692. This application Sep. 11, 1984, Ser. No. 649,401
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—99 R **4 Claims**

1. In a receptacle for use with flat elongate multiconductor electrical cable and adapted for placement on said cable in

disposition spanning plural laterally spaced conductors extending longitudinally in said cable, including an elongated housing having a length at least sufficient to span the lateral expanse of said conductors in said cable, plural contact means supported by said housing associated separately with said cable conductors, said plural contact means being longitudinally spaced in said housing for individual lateral registration with respective cable conductors, each of said contact means having a terminal portion for external connection thereto and an insulation piercing portion disposed to pierce cable insulation and engage a respective conductor of said cable, and means for urging the insulation piercing portions of said contact means into engagement with the respective cable conductors, wherein the improvement comprises:



a conductive contacting member supported by said housing, said conductive contacting member being distinct from and disposed adjacent to a selected one of said contact means, said conductive contact member including an insulation piercing portion adapted to extend into insulation piercing relation with the same cable conductor to which said selected contact means is to be engaged, said urging means including a support member adapted for disposition underneath said flat cable and wherein said conductive contacting member insulation piercing portion has a threaded portion of extent to extend through said respective cable conductor and into threaded receipt in said support member, said selected one of said contact means including an opening through which said threaded portion of said conductive contacting member is received.

4,624,523

CANTILEVERED REDUNDANT TERMINAL

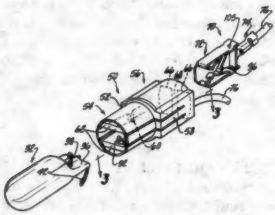
Remie P. Durand, Fraser, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 3, 1985, Ser. No. 752,264

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] H01R *13/502*

U.S. Cl. 339—176 L **3 Claims**



1. A snap-in lamp terminal for use in a socket housing for receiving, locating and positioning a wedge-base bulb having a pair of filament extension wires positioned on sides of the wedge base, a pair of troughs extending transverse to the wedge base, the wedge base further having a centrally located cylindrical vent tube and a bulbular evacuated chamber both in the same longitudinal axis, the vent tube bounded by laterally extending side wings of the wedge base, the snap-in terminal comprising:

a lamp receiving portion and a conduit receiving portion;

the conduit receiving portion including wire retention means;

the lamp receiving portion of a generally channelized shape having a terminal base and terminal sides forming the channel;

cantilevered contact arms projecting into the interior of the generally channelized lamp receiving portion from the terminal side via folded tabs;

the contact arms including spring contact members for communication with the detent troughs of the bulb and filament wires of the bulb;

the terminal sides having curved bulb guides at the lamp receiving end to communicate with the wedge-base bulb;

a wire guide means projecting into the interior of the generally channelized lamp receiving portion from one of the terminal sides such that a wiping action will occur when the wedge-base bulb is inserted into the terminal whereby the wire guide means wipes along the vent tube of the bulb thereby straightening any skewed portion of the filament wires; and

redundant terminal means comprising a cantilevered redundant terminal formed from a terminal side into the interior of the generally channelized lamp receiving portion of the snap-in terminal and affixed to the side via a folded tab, the cantilevered redundant terminal being directed toward the contact arm designed for contact with the filament wires of the wedge-base bulb.

4,624,524

BASE REDUNDANT TERMINAL

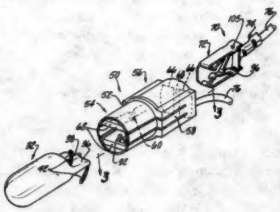
Remie P. Durand, Fraser, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 3, 1985, Ser. No. 752,411

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] H01R *13/502*

U.S. Cl. 339—176 L **2 Claims**



1. A snap-in lamp terminal for use in a socket housing for receiving, locating and positioning a wedge-base bulb having a pair of filament extension wires positioned on sides of the wedge base, a pair of troughs extending transverse to the wedge base, the wedge base further having a centrally located cylindrical vent tube and a bulbular evacuated chamber both in the same longitudinal axis, the vent tube bounded by laterally extending side wings of the wedge base, the snap-in terminal comprising:

a lamp receiving portion and a conduit receiving portion;

the conduit receiving portion including wire retention means;

the lamp receiving portion of a generally channelized shape having a terminal base and terminal sides forming the channel;

cantilevered contact arms projecting into the interior of the generally channelized lamp receiving portion from the terminal side via folded tabs;

the contact arms including spring contact members for communication with the detent troughs of the bulb and filament wires of the bulb;

the terminal sides having curved bulb guides at the lamp receiving end to communicate with the wedge-base bulb;

a wire guide means projecting into the interior of the generally channelized lamp receiving portion from one of the terminal sides such that a wiping action will occur when the wedge-base bulb is inserted into the terminal whereby the wire guide means wipes along the vent tube of the bulb thereby straightening any skewed portion of the filament wires; and

the redundant terminal means comprising a base redundant terminal notched outward from the terminal base toward the interior of the generally channelized lamp receiving portion of the snap-in terminal and directed toward the contact arm designed to make contact with the filament wires.

4,624,525

COAXIAL CABLE CONNECTOR

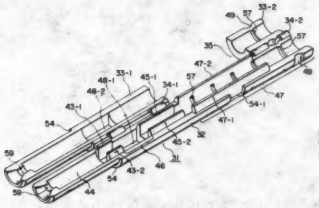
Yoshiaki Ichimura; Natsuki Kawabe; Haruo Hayashi, and Kouzou Uekido, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry Limited and NEC Corporation, both of Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,837

Claims priority, application Japan, Jun. 22, 1984, 59-93657

Int. Cl.⁴ H01R *17/18*

U.S. Cl. 339—177 R **20 Claims**



1. A coaxial cable connector comprising

a cylindrical holder made of an insulator material and composed of a support member and a lid member of semi-cylindrical configuration which correspond to parts formed by dividing said cylindrical holder into two parts along the axial center of said cylindrical holder, the interior of a front end portion of said cylindrical holder being shaped to define a contact holding section, the rear of said contact holding section being shaped to define a core wire connection section, the rear of said core wire connection section being shaped to define a cable holding section, and said cable holding section having an opening formed therein,

a center contact held in said contact holding section of said cylindrical holder, said center contact engaging and being electrically connected to a contact to be connected which is inserted into said cylindrical holder from the front end of said holder, said center contact having an integral connection segment extending to said core wire connection section,

a coaxial cable one end of which is stored and held inside said cylindrical holder at the rear of said contact holding section with the other end of said coaxial cable being led out of the rear end of said cylindrical holder, said one end of said coaxial cable having a core wire which is exposed and electrically connected to said connection segment in said core wire connection section, said one end of said coaxial cable also having an outer conductor portion which is folded down and located opposite to said opening,

an elastic ferrule positioned in said opening and interposed between a sheath of said coaxial cable in said cable holding section and said folded outer conductor portion, and

a metallic cylindrical body into which said cylindrical holder is inserted and held therein, said metallic cylindrical body being electrically connected to said outer conductor through elastic deformation of said ferrule.

4,624,526

OPTICAL PICKUP DEVICE

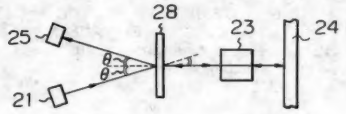
Yoshiyuki Tsukai, and Akihiro Tachibana, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 564,328

Claims priority, application Japan, Dec. 25, 1982, 57-233886

Int. Cl.⁴ G02B *5/32, 5/18;* G11B *7/13*

U.S. Cl. 350—3.72 **4 Claims**



1. An optical pickup device for picking up information recorded on a recording medium comprising:

an illuminating light beam source;

diffraction means for diffracting the illuminating light beam into ±1 order diffraction beams and directing one of the ±1 order diffraction beams towards the surface of said recording medium, said diffraction means diffracting the beam reflected by said surface of said recording medium into ±1 order diffraction beams to separate said beam reflected by said surface of said recording medium from said illuminating light beam; and,

a photo detection means positioned for directly receiving one of said ±1 order diffracted reflected beams from said diffraction means and providing an output signal carrying said information recorded on said recording medium.

4,624,527

RADIATION-UTILIZING MEASUREMENT SYSTEM

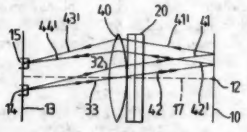
Evan S. Cameron, and Linda P. Shaw, both of Edinburgh, Scotland, assignors to Ferranti, plc, Cheadle, England

Filed Oct. 6, 1983, Ser. No. 539,560

Claims priority, application United Kingdom, Oct. 16, 1982, 8229615

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.5 **5 Claims**



1. A radiation-utilising measurement system including a planar, specular rotatable reflector having an axis of rotation and being capable of rotation about said axis, a fixed source of a beam of radiation, and a fixed point detector, the arrangement being such that the beam is capable of being incident upon the rotatable reflector, and the detector being capable of receiving radiation after reflection by the reflector, there being a plane at right angles to the axis of rotation of the reflector and

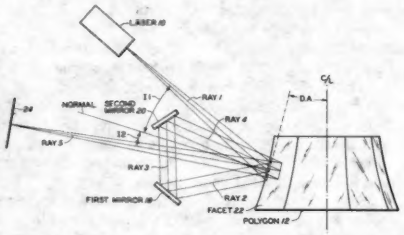
including the source and the detector, the plane also including the optic axis of the system extending equidistant between the source and the detector, and there being a plane including the axis of rotation of the reflector and the optic axis, the system having a refracting arrangement with an optic axis coincident with the optic axis of the system to transmit both the beam of radiation incident upon the reflector, and the reflected beam of radiation incident upon the detector, and the refracting arrangement at least includes a thin refracting element, having zero power in the plane at right angles to the axis of rotation of the reflector and including the source and the detector, and in this plane a collimated beam portion is arranged to be incident upon the reflector, and the system is arranged so that the reciprocal of the distance of the refracting element from the source, plus the reciprocal of the distance of the refracting element from the reflector, is equal to the reciprocal of the focal length of the refracting element in the plane including the axis of rotation of the reflector and the optic axis, in which latter plane the refracting element has a positive power.

4,624,528

SCANNING SYSTEMS WITH POLYGON SCANNER HAVING CURVED FACETS

Harry P. Brueggemann, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1985, Ser. No. 703,970
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.7 **5 Claims**



1. In a light scanning system including a multi-surface mirror assembly having an axis of rotation, including a light source for introducing a source of light toward said multi-surface mirror assembly, said light being reflected in turn by each of said surfaces of said mirror assembly, a first fixed mirror placed in the path of said reflected light from said multi-surface mirror assembly, a second fixed mirror placed in the path of said reflected light from said first mirror, said second mirror reflecting said light back to the same surface of said rotating multi-surface mirror assembly for a last reflection, said last reflection being a scanning light beam of predetermined range of arc of one rotation of said multi-surface mirror assembly, the improvement comprising said multi-surface mirror assembly comprising a polygonal array of non-planar mirror facets, said mirror facets having a predetermined draft angle with respect to the axis of rotation of said multi-surface mirror assembly.

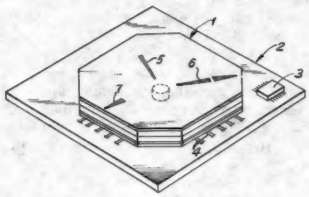
4,624,529

LIQUID CRYSTAL DISPLAY WITH CENTRAL INTERCONNECTIONS

Leonard M. Dorfman, Campbell, Calif., assignor to Timex Corporation, Waterbury, Conn.

Filed Nov. 16, 1984, Ser. No. 672,037
Int. Cl.[4] G02F *1/13*; G04C *17/00*
U.S. Cl. 350—334 **4 Claims**

1. Improvement in a liquid crystal display for a solid state analog timepiece, said display having upper and lower spaced substrates with liquid crystal material sealed therebetween and having a plurality of opposed transparent electrodes on the substrates, the improvement comprising a plurality of radial electrodes on the upper substrate, a plurality of contact terminals arranged in a first array on the central portion of said upper substrate and each connected to one of said radial electrodes, said other substrate defining a central hole there-



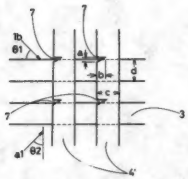
through providing access to said first array, and elastomeric connector means disposed in said hole and having a plurality of imbedded discrete conductors making contact with said contact terminals.

4,624,530

EDGE DOMAIN-FREE LIQUID CRYSTAL DISPLAY OF DOT MATRIX TYPE

Shoichiro Takahara, and Masayuki Kikuno, both of Soraku, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1984, Ser. No. 594,302
Claims priority, application Japan, Apr. 30, 1983, 58-77811
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—336 **15 Claims**



1. A field effect mode liquid crystal display element comprising;

liquid crystal display molecules sealed between upper and lower electrodes formed on the surfaces of upper and lower substrates, said upper and lower electrodes respectively have configurations different from each other so that any desired pattern can be displayed at a position where both electrodes cross; and

a cutout portion, provided either in the upper or lower electrode, which prevents liquid crystal display molecules from being inversely oriented as would otherwise occur at a position where both electrodes cross, the size of said cutout portion being as small as possible.

4,624,531

LIQUID CRYSTAL DEVICE WITH A POSITIVE DISPLAY

Masanobu Wada; Tatsuo Uchida, both of Sendai, and Toru Teshima, Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

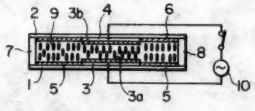
Filed Jun. 12, 1980, Ser. No. 158,809
Claims priority, application Japan, Jun. 22, 1979, 54-78082
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—340 **1 Claim**

1. A liquid crystal device including:

a mixture of a liquid crystal, having a positive dielectric anisotropy as a host material, and a dichroic dye as a guest material, said mixture being disposed between a pair of glass substrates in an enclosed cell;

each of said substrates having a transparent electrode of a required pattern adherently formed on its inner surface, at least a portion of said pattern of the transparent electrode on each substrate having a parallel-orientation film for causing

orientation of molecules of the liquid crystal in a direction parallel to the plane of the substrate in the absence of a voltage applied and the remaining portions of said pattern and also the inner surface of said substrate to be in contact with the liquid crystal having a perpendicular-orientation film for causing orientation of the molecules of the liquid crystal in a direction perpendicular to the



plane of the substrate in the absence of a voltage applied,

wherein said parallel-orientation film does not overlap said perpendicular-orientation film, said parallel-orientation film on one substrate has substantially the same area as that of the film on the other substrate, and said portion covered with said parallel-orientation film of the electrode pattern on one substrate has a size different from that on the other substrate so that there exists, on one electrode pattern, at least a portion of said parallel-orientation film which is not sandwiched between the opposing electrodes and does not overlap any portion of said perpendicular-orientation film.

4,624,532

DICHROIC LIQUID CRYSTAL COMPOSITIONS CONTAINING ANTHRAQUINONE-BASED DYES

Sigfried Aftergut, Schenectady, and Herbert S. Cole, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

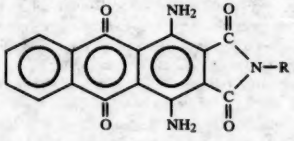
Division of Ser. No. 199,589, Oct. 22, 1980, Pat. No. 4,356,102. This application Jul. 27, 1982, Ser. No. 402,397

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.⁴ G02F *1/13*; C09K *3/34*

U.S. Cl. 350—349 **13 Claims**

1. A liquid crystal composition comprising a host liquid crystal material and a guest anthraquinone dye having the formula



wherein R is a member selected from the group consisting of an alkoxyalkyl radical having from 1 to 4 carbon atoms in the alkyl and the oxyalkyl segment, and a straight chain alkyl or substituted alkyl radical having from about 1 to 10 carbon atoms.

4,624,533

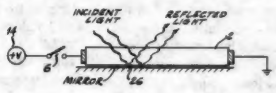
SOLID STATE DISPLAY

Herman P. Schutten, Milwaukee, Wis.; Robert W. Lade, Fort Myers, Fla., and James A. Benjamin, Waukesha; Stanley V. Jasolski, Sussex; Gordon B. Spellman, Mequon, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 6, 1983, Ser. No. 482,695

Int. Cl.⁴ G02F *1/015*

U.S. Cl. 350—354 **1 Claim**



1. A method for controlling transmission of light comprising:

providing a semiconductor;

directing short wavelength light onto said semiconductor, said short wavelength light having an energy greater than the energy bandgap of said semiconductor to raise carriers from the valence band to the conduction band in said semiconductor and saturate said conduction band to prevent further absorption such that the remaining photons in the incident short wavelength light pass through said semiconductor such that said semiconductor is normally transparent to said incident short wavelength light; and providing an ohmic connection to said semiconductor completing an electric circuit and

electrically removing carriers from said conduction band and desaturating said conduction band without reducing incident light intensity, to enable further absorption of said incident short wavelength light in said semiconductor by raising additional carriers to said conduction band such that said semiconductor becomes opaque to said incident short wavelength light.

4,624,534

ACOUSTOOPTIC DEFLECTION DEVICE CAPABLE OF REDUCING A REFLECTION LOSS OVER A WIDE FREQUENCY BAND

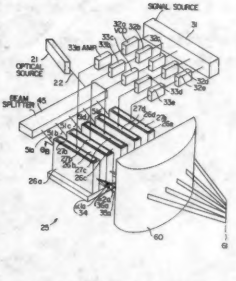
Satoru Amano, Yamanashi, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 626,790

Claims priority, application Japan, Jun. 30, 1983, 58-118529

Int. Cl.⁴ G02F *1/33*

U.S. Cl. 350—358 **11 Claims**



1. An acoustooptic deflection device responsive to a single incident light beam for producing a predetermined number of outgoing light beams resulting from said indicent light beam, said device comprising beam splitting means for splitting an incident light beam into split light beams equal in number to said predetermined number, signal producing means for producing carrier signals which are equal in number to said predetermined number and which have frequencies falling within

frequency bands different from one another, deflecting means equal in number to said predetermined number for individually and acoustooptically deflecting said split light beams in response to said carrier signals to produce deflected light beams as said outgoing light beams, respectively, and an optical lens system for collecting said outgoing light beams at a predetermined position in a predetermined geometric arrangement.

4,624,535

OBJECTIVE LENS SYSTEM FOR MICROSCOPES

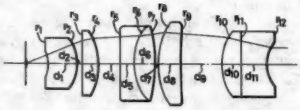
Takashi Kurihara, and Chikara Nagano, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 529,867, Sep. 7, 1983, abandoned. This application Nov. 5, 1984, Ser. No. 668,220

Claims priority, application Japan, Sep. 10, 1982, 57-156722; Mar. 16, 1984, 59-46618

Int. Cl.[4] G02B *21/02, 9/60*

U.S. Cl. 350—414 10 Claims



1. An objective lens system for microscopes consisting of a first meniscus lens component having a concave surface on the object side, a second positive lens component, a third cemented doublet consisting of a positive lens element and a negative lens element, a fourth positive lens component and a fifth meniscus lens component having a convex surface on the object side, said objective lens system being so designed that the working distance thereof is larger than 0.4f and said objective lens system satisfies the following conditions (a) and (b):

$$R_a/R_b < 1.0 \quad \text{(a)}$$

$$0.3f < D_4 < 2.0f \quad \text{(b)}$$

wherein the reference symbols R_a and R_b respectively represent radii of curvature on the surfaces on the object side and image side of said first lens component, the reference symbol D_4 represents the airspace between said fourth lens component and said fifth lens component and the reference symbol f represents the focal length of said objective lens system as a whole.

4,624,536

FOUR COMPONENT ZOOM LENS

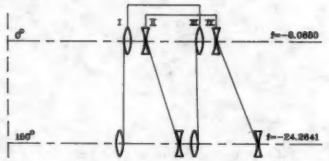
Jihei Nakagawa, Kawasaki, Japan, assignor to Sigma Corporation, Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,249

Claims priority, application Japan, Feb. 2, 1982, 57-14348

Int. Cl.[4] G02B *15/00, 15/15*

U.S. Cl. 350—423 6 Claims



1. A zoom lens system comprising a body, first, second, third and fourth spaced apart lenses mounted on said body with their optical axes aligned, said second lens being between said first and third lenses, and said third lens being between said second and fourth lenses, first means for simultaneously moving said first and third lenses linearly, while in fixed spaced relation to each other, second means for simultaneously moving said second and fourth lenses linearly, while in fixed spaced relation to each other, and third means for moving said first and third lenses while simultaneously moving said second and fourth lenses differently from said first and third lenses, through a predetermined operable range of movement of said lenses to vary the power of the zoom lens system, and wherein, said first, second, third and fourth lenses are the only lenses of said zoom lens system.

4,624,537

ARRANGEMENT FOR MULTIPLYING THE OUTPUT OF AN ACTUATING MANIPULATOR BY A FACTOR DEPENDENT UPON THE SPEED OF THE ACTUATING MOVEMENT THEREOF TO CONTROL THE MOVEMENT OF A DISPLACEABLE MEMBER OF AN APPARATUS

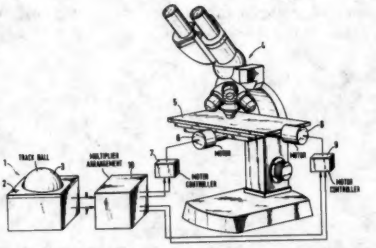
Adalbert Hanssen, Aalen-Unterkochen, and Jürgen Schwarz, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Aug. 21, 1984, Ser. No. 642,758

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330476

Int. Cl.[4] G02B *21/26;* G09G *3/02*

U.S. Cl. 350—531 16 Claims



1. An arrangement for controlling the movement of a displaceable member of an apparatus, the arrangement comprising electro-mechanical manipulator means providing a first pair of signals in response to a mechanical displacement indicative of a first coordinate of a displacement through which the displaceable member is to be moved and a second pair of signals in response to said mechanical displacement and indicative of a second coordinate of the displacement through which the displaceable member is to be moved;

sensing circuit means including:

first circuit means for detecting said first pair of signals;

second circuit means for detecting said second pair of signals;

factor forming circuit means for combining the outputs of said first circuit means and said second circuit means and forming a factor dependent upon the speed of movement through said mechanical displacement;

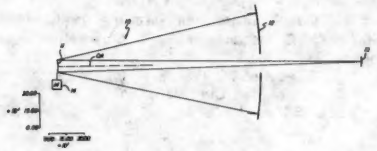
multiplier circuit means for multiplying said first pair of signals by said factor to form a first coordinate output signal for actuating said displaceable member in said first coordinate and for multiplying said second pair of signals by said factor fo form a second coordinate output signal for actuating said displaceable member in said second coordinate; and,

frequency reducing means connected to the output of said multiplier means.

4,624,538
COMA-COMPENSATION TELESCOPE

Malcolm J. MacFarlane, Newtown, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 28, 1985, Ser. No. 737,762
Int. Cl.[4] G02B *23/06, 13/14, 17/00*
U.S. Cl. 350—620 5 Claims

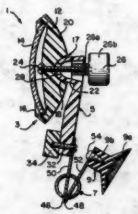


1. In a two mirror telescope for use in infrared astronomy;
a primary mirror;
a secondary mirror disposed relative to said primary mirror to form a telescope;
means for tilting one of said mirrors continuously back and forth relative to the mechanical axis of the telescope;
said one of said mirrors being so constructed and arranged to have an intrinsic field coma on axis equal and opposite to tilt coma on axis at any tilt angle of said one mirror relative to said other mirror;
an infrared detector disposed on the mechanical axis at the back focus point of the telescope.

4,624,539
PORTABLE MIRROR DEVICE FOR REAR VIEW OBSERVATION IN A MOTOR VEHICLE

Peter C. King, 2424 Franklin, Columbus, Ind. 47201, and James C. Arthur, 4030 N. Riverside Dr., Columbus, Ind. 47203

Filed Apr. 16, 1985, Ser. No. 723,816
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—632 8 Claims

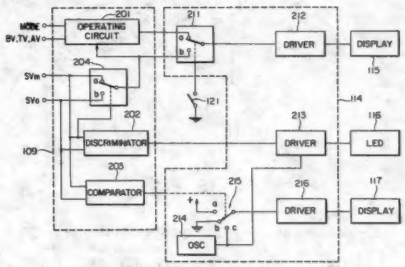


1. Portable mirror device for rear view observation in a motor vehicle or the like comprising:
(a) a spring clip having a pair of clip members connected by a spring member, said spring member biasing said clip members toward a position wherein first, holding ends of the clip members engage each other;
(b) suction cup means fastened to a second end of one of said clip members;
(c) an adjustment arm swivally connected at one end to a second end of the other of said clip members; and
(d) mirror means connected to an opposite end of said adjustment arm from the spring clip by a ball-and-socket type joint.

4,624,540
FILM SPEED SETTING DEVICE FOR CAMERA

Sunao Ishizaka, and Osamu Maida, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,299
Claims priority, application Japan, Mar. 12, 1984, 59-46865
Int. Cl.[4] G03B *7/24, 17/18*
U.S. Cl. 354—21 3 Claims



1. A camera capable of using a film cartridge bearing code indicia indicating a film speed of a film contained in said cartridge, comprising:
(a) first means for detecting said film speed from said code indicia of said film cartridge loaded in said camera and generating a first corresponding signal;
(b) second means for manually setting the film speed and generating a second corresponding signal;
(c) means connected to said first and second means and adapted to produce a first alarm output when neither said first nor said second signal is generated and to produce a second alarm output when both said first and second signals are generated and when the film speed corresponding to said first signal and the film speed corresponding to said second signal are mutually different; and
(d) alarm means including means for preventing the operation of said camera for photography and display means having a first display state and a second display state different from said first display state, said alarm means further including means for driving said preventing means and said display means in said first display state in response to said first alarm output and for driving said display means in said second display state in response to said second alarm output.

4,624,541
MULTIPLE FUNCTION CAMERA

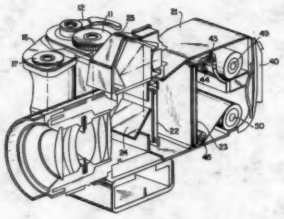
Sea C. Park, 3836 Birchwood, Skokie, Ill. 60076

Filed Oct. 26, 1984, Ser. No. 664,973
Claims priority, application Rep. of Korea, Jun. 23, 1984, 3598/1984
Int. Cl.[4] G03B *13/02, 17/50, 19/12*
U.S. Cl. 354—83 12 Claims

1. A single lens reflex camera which can be modified to also function as a mid-format, more sophisticated camera which comprises
a main camera body containing a film advancing lever, a film storage shaft and a film advancing shaft which connects with said film advancing lever, said film advancing shaft containing film sprockets which are adapted to engage and advance the film through the camer through the operation of the film advancing lever,
a lens system containing a reflecting mirror,
a film back attachment housing adapted to be connected to the back of the main camera body, said film back attachment housing changing the film plane from that of a single lens reflex camera to that of a mid-format camera, said

film back attachment housing containing a film advancing system for conveying 120 mm or 220 mm film across said changed film plane,

a gear system providing communication between said film advancing shaft and said film advancing system of the film back attachment housing whereby the film in the film back attachment housing can be advanced across the



changed film plane by the operation of the film advancing lever, and

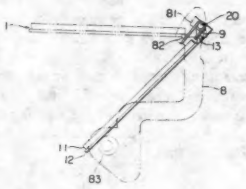
an adjustable view finder having a focusing screen, said view finder being adjustable to accommodate the film planes of both the single lens reflex camera and the mid-format camera, so that the distance from the center of the mirror to the desired film plane is equal to the distance from the center of the mirror to the focusing screen.

4,624,542

BUFFER FOR VIEWFINDER MIRROR IN A SINGLE LENS REFLEX CAMERA

Tomohisa Ikeno, Tokyo; Akira Katayama, Koganei, and Hidefumi Obo, Tokyo, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,036
Claims priority, application Japan, Feb. 3, 1984, 59-18891
Int. Cl.[4] G03B *19/12*
U.S. Cl. 354—152 **15 Claims**



1. In a camera having a viewfinder mirror rotatable between first and second positions on a swing axis parallel to a reflection surface of the mirror in order to switch over the optical path of a light beam coming through a photographing lens of the camera, apparatus for supporting said mirror comprising:

a base plate member fixedly mounted on said camera;

stop means fixedly mounted on said camera and disposed to contact one end of said mirror for stopping said mirror at said second position when said mirror reaches said second position from said first position;

connection means cooperable between another end of said mirror and said base plate member for connecting said mirror with said base plate member, said connection means including a shaft member disposed along said swing axis and half bearing means for supporting said shaft member for rotation on said swing axis and for permitting said shaft member to shift from said swing axis by a predetermined amount in a direction in which a force acts on said another end of said mirror when said mirror is stopped by said stop means, said direction being substantially perpendicular to said reflection surface of said mirror; and

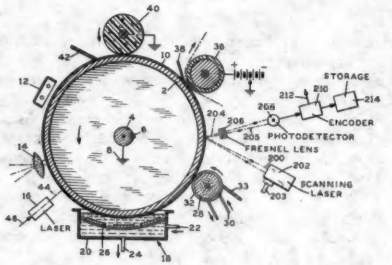
biasing means acting on said connecting means for maintaining said shaft member on said swing axis during rotation of said mirror from said first position to said second position.

4,624,543

METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHICALLY PROCESSING INFORMATION

James R. Young, Palo Alto, and Norman A. Peppers, Belmont, both of Calif., assignors to Savin Corporation, Stamford, Conn.

Filed Aug. 26, 1981, Ser. No. 296,297
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **3 Claims**



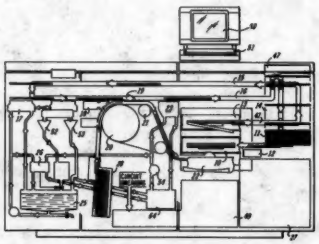
1. Apparatus for electrophotographically processing information including in combination a photoconductor having a surface, means for electrostatically charging the surface of said photoconductor, means for forming a latent electrostatic image of the desired information on said charged surface, means for developing said latent electrosatic image to form a visible toned image thereof, means for scanning along a line of said visible image with a light beam, a photodetector, and means including a lens for directing light specularly reflected from said photoconductor along the scan line onto said photodetector, said lens having a certain focal length and being positioned at a distance from said surface which is less than its focal length to produce a virtual image of the scan line behind said surface and remote from the photodetector.

4,624,544

AUTOMATIC XEROGRAPHIC PLATE DEVELOPMENT SYSTEM

Lothar S. Jeromin, Sierra Madre, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1985, Ser. No. 800,876
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **5 Claims**



1. An automatic system for developing an image from a

xerographic plate, which during exposure to x-rays and ambient light is enclosed in a cassette, comprising

a development station,

an image transfer station,

a cleaning station,

a changing station,

input-output means, and

an elevator having, from bottom to top, a stack of stored plates, a first, second, third and fourth level, the fourth level having a means for heating said plate to remove residual images,

wherein the above mentioned components are situated within the system in the order stated from one end of the system to the other,

said input-output means further comprising, from top to bottom, an input station into which the cassette containing an exposed plate is inserted, an output station from which is discharged a charged plate enclosed within a cassette, and an image output station where the finished image, on paper, is delivered to the operator,

and further comprising means for transporting said plate through the system, which also has levels corresponding to those of the elevator, to the various stations in the following order; from the input station to the first level of the elevator, to the third level, to the other end of the system, to the second level, to the development station, to the transfer station, to the cleaning station, to the elevator, to the fourth level, and then onto the top of the stored stack of plates.

4,624,545

DEVELOPING DEVICE WITH REGULATED DEVELOPER SUPPLY

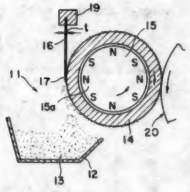
Wataru Yasuda, Yokohama; Koji Sakamoto; Toshio Kaneko, both of Tokyo, and Fuchio Kanno, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

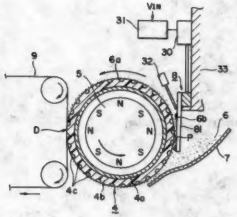
Filed Oct. 14, 1983, Ser. No. 542,034

Claims priority, application Japan, Oct. 15, 1982, 57-179900; Dec. 10, 1982, 57-186003[U]

Int. Cl.⁴ G03G *15/09*

U.S. Cl. 355—3 DD **5 Claims**





1. A device for developing an electrostatic latent image formed on an image bearing member at a developing station, comprising:

transporting means for transporting developer as carried thereon along a predetermined path and past said developing station;

supply means for supplying said developer to said transporting means; and

regulating means disposed downstream of said supply means for regulating the supply of said developer to said transporting means to thereby form a thin film of charged developer on said transporting means, said regulating means including a pressure plate having an easily deflectable portion which is in pressure contact with said transporting means for forming said thin film of charged developer;

wherein said pressure plate has a free end extending, at said pressure contact, in a direction opposite to that of said path;

wherein said easily deflectable portion is defined by a reduced thickness region; and

wherein said pressure plate has a composite structure in which a plurality of spring plates having differing widths are integrally overlaid on top of another such that their bottom ends terminate short of the next one.

4. A device for developing an electrostatic latent image formed on an image bearing member at a developing station, comprising:

transporting means for transporting developer as carried thereon along a predetermined path and past said developing station;

supply means for supplying said developer to said transporting means;

regulating means disposed downstream of said supply means and pressed against said transporting means for regulating the supply of said developer to said transporting means to thereby form a thin film of charged developer on said transporting means; and

cleaning means for cleaning said regulating means to thereby prevent said developer from being permanently stuck to said regulating means;

wherein said developer is carried in a selected direction relative to said regulating means, and said regulating means extends in a direction opposite said selected direction;

further comprising first position control means for moving said regulating means between first and second positions with respect to said transporting means, wherein said cleaning means is fixed in position and partly in contact with said regulating means, so that developer sticking to said regulating means is scrubbed and removed by said cleaning means when the regulating means is moved between said first and second positions.

4,624,546

IMAGE FORMING APPARATUS WITH A SORTER

Yukihiro Fukushi, Kawasaki, and Hiroyuki Segawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed May 28, 1985, Ser. No. 737,939

Claims priority, application Japan, May 30, 1984, 59-110214

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 R **7 Claims**

1. An image forming apparatus comprising:

means for forming an image on a copy sheet;

means for delivering the copy sheet carrying the image formed by said image forming means;

means for collating the copy sheet delivered by said delivering means;

means for covering said delivering means, said covering means being adapted to be openable so as to permit access to said delivering means to remove the copy sheet;

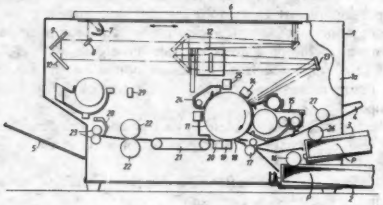
first detecting means for detecting the opening of said covering means;

second detecting means for detecting a jamming of the copy sheet in said collating means;

first control means for stopping the image forming operation

of said image forming means in response to the detection of said second detecting means; and

second control means for permitting the restarting of the image forming operation in response to the detection of



the opening of said covering means by said first detecting means only if said second detecting means detects that the jamming of the copy sheet in said collating means has been cleared.

4,624,547

IMAGE FORMING APPARATUS

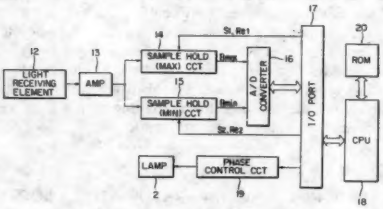
Makoto Endo, Tokyo; Satoshi Ono, Yokohama; Takao Toda, Tokyo; Kazuo Kashiwagi, Tokyo; Masaaki Yanagi, Tokyo, and Yoshihiro Saito, Hachioji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,335

Claims priority, application Japan, Jun. 28, 1983, 58-115177; Jun. 28, 1983, 58-115178; Dec. 28, 1983, 58-245337; Dec. 28, 1983, 58-245338; Dec. 28, 1983, 58-245339

Int. Cl.[4] G03G *15/00*; G03B *27/72*

U.S. Cl. 355—14 E **21 Claims**



1. An image forming apparatus comprising:

image forming means for forming an image corresponding to an original on a recording material;

detecting means for continuously detecting the image density of the original, said detecting means detecting the maximum and minimum values of the image density; and

control means for controlling an operable condition of said image forming means to regulate the copy density in response to the maximum and minimum values of the image density detected by said detecting means;

wherein said control means comprises memory means for storing a plurality of control data corresponding to the maximum and minimum values of the image density, and wherein said control means obtains access data in response to the maximum and minimum values from said detecting means, accesses said memory means in response to the access data, and controls said operable condition in response to said control data obtained by said access data.

4,624,548

IMAGE DENSITY CONTROL DEVICE

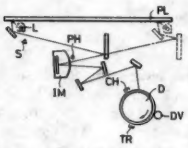
Yoshiaki Takayanagi, Ichikawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1984, Ser. No. 632,006

Claims priority, application Japan, Jul. 22, 1983, 58-134838; Jul. 22, 1983, 58-134839

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 D **7 Claims**



1. An image density control device comprising:

density detection means for detecting the density of an original, while an image forming operation is performed on a recording material;

leading edge detection means for detecting a leading edge of the original; and

control means for controlling image forming conditions of an image forming means according to an output of said density detection means, wherein said control means controls said image forming conditions optimumly by means of a combination of the original density detected by said density detection means, in a divided predetermined area or for a given period of time from a signal corresponding to the original leading edge to be output from said leading edge detection means, and the original density detected by said density detection means, in an area located before or after said predetermined area or for a period of time before or after said given period of time.

4,624,549

COPYING MACHINE WITH EASY REMOVAL OF IMAGE TRANSFER MEMBER

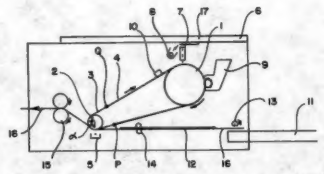
Itsurou Katoh, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 15, 1983, Ser. No. 551,727

Claims priority, application Japan, Nov. 18, 1982, 57-203132

Int. Cl.[4] G03G *15/02, 15/14, 21/00*

U.S. Cl. 355—3 BE **9 Claims**



1. A photoelectric copying machine for transferring an image from an original document to an image transfer medium, said machine comprising:

first and second rotating drums;

an endless belt encircling said first and second rotating drums and moving in concert with the rotation thereof;

a sensitizer formed on only a substantial portion of the surface of said endless belt, and movable therewith, wherein said endless belt comes to rest with the portion thereof which is not covered by said sensitizer resting around said first rotating drum;

means for moving the image transfer medium through said

machine along a predetermined path, said path tangentially intersecting said endless belt adjacent said first rotating drum;

a charger positioned along said predetermined path adjacent said first rotating drum to precharge said sensitizer as it passes thereby;

optical image potential forming means for reading said original document and optically forming a potential variation on said sensitizer corresponding to the image present on said original document; and

means for supplying toner to said potential variation formed on said sensitizer by said optical image potential forming means to form a toner image on said sensitizer corresponding to said image from said original document;

said charger also applying charge to said toner image as said image transfer member passes thereby to transfer said toner image to said image transfer member.

4,624,550

METHOD AND APPARATUS FOR PHOTOGRAPHING SURFACES OF SOLID OBJECTS

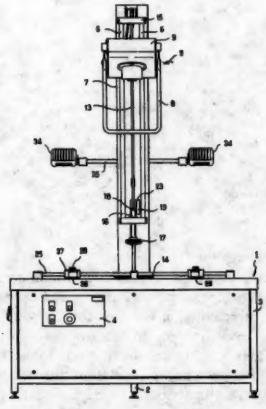
Eric de Bazelaire, Lons, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Oct. 4, 1985, Ser. No. 784,116

Claims priority, application France, Oct. 8, 1984, 84 15376

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—40 **18 Claims**



1. Apparatus for photographing a circumferential surface of revolution of a solid object comprising support means for rotatably supporting the object for rotation about the axis of said surface, a photographic device including means for moving a film at a linear velocity synchronously with the speed of rotation of the object, illumination means for the object, means for humidification of the object, and means for forming a film of fluid over said surface of the object during the photography thereof.

4,624,551

LIGHT IRRADIATION CONTROL METHOD FOR PROJECTION EXPOSURE APPARATUS

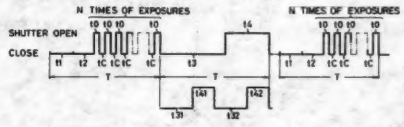
Satoru Anzai, Zama, and Masashi Okada, Yotsukaido, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 651,214, Sep. 14, 1984, abandoned. This application Oct. 28, 1985, Ser. No. 793,474

Claims priority, application Japan, Sep. 17, 1983, 58-171819; Oct. 4, 1983, 58-184438; Oct. 5, 1983, 58-186268

Int. Cl.[4] G03B *27/42, 27/72*

U.S. Cl. 355—53 **20 Claims**



1. In a projection exposure apparatus in which an image of a photographic mask is formed on a substrate by using a projection optical system arranged between the photographic mask and the substrate, the method of controlling the incidence of light energy to the projection optical system comprising the steps of:

(a) calculating the amount of light energy incident per unit time to said projection optical system during exposure of said substrate and

(b) projecting, after the completion of said exposure of said substrate, substantially the same amount of light energy as said incident light energy unit time to said projection optical system at intervals of said unit time.

4,624,552

MAGNIFICATION CONTROL DEVICE

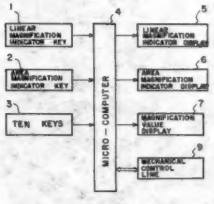
Makoto Asako, Tokyo, Japan, assignor to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,133

Claims priority, application Japan, May 22, 1984, 59-103396

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—55 **6 Claims**



1. A magnification control device adapted to be used with an electrophotographic copying apparatus, said magnification control device being adapted to set the copying magnification of said copying apparatus in a stepless fashion, said device comprising means for inputting a desired copying magnification, a magnification mode selector comprising means for indicating whether the desired copying magnification which has been inputted by said input means should be treated as a linear copying magnification or an area copying magnification, a memory comprising means for storing the desired copying magnification which has been inputted by said input means, an arithmetic processor which is responsive to a mode indicated by said magnification mode selector, said arithmetic processor comprising means for converting the desired copying magnification stored in said memory from a linear magnification to an area magnification or from an area magnification to a linear magnification, a display comprising means for displaying the

value of the converted magnification which has been obtained by said arithmetic processor as a result of converting the desired copying magnification, and control means for determining an actual copying magnification in response to said converted magnification obtained by said arithmetic processor.

4,624,553

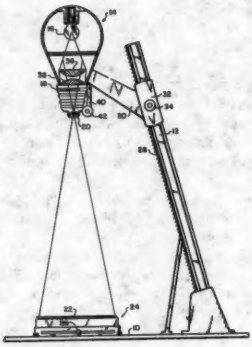
PHOTOGRAPHIC ENLARGER APPARATUS WITH CRITICAL FOCUSING PLATFORM FOR PHOTOSENSITIVE MEDIUM

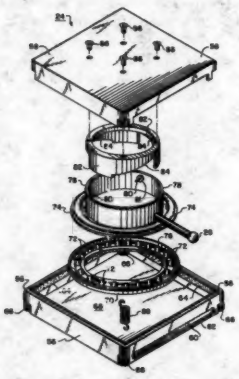
Alwood E. Harvey, Boutonville Rd., Cross River, N.Y. 10518

Filed May 28, 1985, Ser. No. 738,484

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—55 **11 Claims**





1. A photographic enlarger apparatus comprising means to hold the object to be enlarged, means for illuminating the object to be enlarged, lens means for projecting the object as an image upon a photosensitive medium, a photosensitive medium holding means for holding the photosensitive medium on which the enlargement is to be produced, said object holding means and said lens means being movable with respect to said photosensitive medium holding means for determining the degree of enlargement and for achieving a focusing of the projected image upon the photosensitive medium, said photosensitive medium holding means including means for precision position adjustment of the distance to said lens means to achieve a critical focus of the projected image upon the photosensitive medium, said photosensitive medium holding means comprising a focusing platform including a base member and a photosensitive support member and said position adjustment means being arranged between said members and being operable to adjust the distance between said members to accomplish the critical focusing, said position adjustment means comprising a first cam means and a second cam means operable to cooperate with said first cam means, one of said cam means comprising at least one shaped cam surface and the other one of said cam means comprising at least one cam follower for following said cam surface, means for rotating one of said cam means with respect to the other, a first connecting means connected from said first cam means to said photosensitive support member and a second connecting means connected from said second cam means to said base member, one of said connecting means comprising a fixed connection from the associated member to the associated cam means which is a non-rotatable cam means and the other one of said connecting means comprising a connection from the associated member to the associated cam means which fixes the lateral and axial positions of said cam means with respect to the associated member while permitting rotation of the associated cam means with respect to said associated member, means for selectively rotating said last-named cam means to selected angular positions, and means for restraining relative rotation between said members.

4,624,554

CHARGING AND EXPOSING HEAD FOR USE IN ELECTROPHOTOGRAPHIC APPARATUS

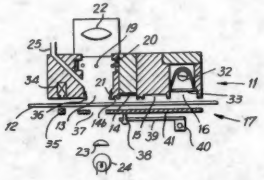
Shuichi Ohtsuka; Hiroshi Matsuoka, and Yoshimitsu Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigarakami, Japan

Filed Oct. 10, 1985, Ser. No. 786,335

Claims priority, application Japan, Oct. 22, 1984, 59-158346[U]

Int. Cl.[4] G03G *15/048, 15/00*

U.S. Cl. 355—64 **4 Claims**

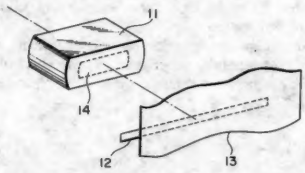


1. A charging and exposing head for use in an electrophotographic apparatus including a charging and exposing chamber having a light transmission window for carrying out charging and exposing operation on an electrophotosensitive member moving along said light transmission window, said head comprising a cooling gas supply conduit connected to said charging and exposing chamber for supplying cooling gas toward the electrophotosensitive member brought opposite to said light transmission window so as to prevent thermal deformation of the electrophotosensitive member during projection of picture image data recorded on the electrophotosensitive member onto a screen by projection light directed from a light source, and a retaining member disposed opposite to said light transmission window for pressing the electrophotosensitive member against said light transmission window so as to maintain the flatness of the electrophotosensitive member in the projection mode.

4,624,555
SLIT EXPOSURE PROJECTION DEVICE

Mitsuhiro Tokuhara, Chigasaki, and Hiroshi Ogawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,263
Int. Cl.[4] G03B 27/72
U.S. Cl. 355—71 20 Claims



1. A slit exposure projection device comprising:

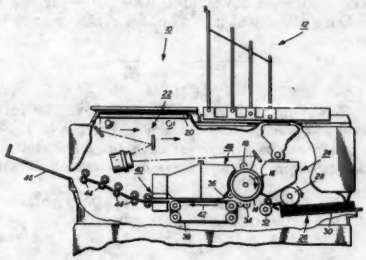
means for confining a light flux reaching a photo-receiving plane to a slit shape; and

a focusing optical system having a pupil which is large in a longitudinal direction of the slit so that a quantity of the light flux is sufficiently large, and which is smaller in a lateral direction of the slit than in the longitudinal direction of the slit, said focusing optical system focusing the light flux onto said photo-receiving plane.

4,624,556
FOLDING WORK ORGANIZER

Paul A. Rodriguez, Voorheesville, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 12, 1985, Ser. No. 754,810
Int. Cl.[4] G03B 27/62; A47F 7/00, 3/14; A47J 47/00
U.S. Cl. 355—75 10 Claims



1. An apparatus for temporary storage and retrieval of sheet like material, including:

a base:

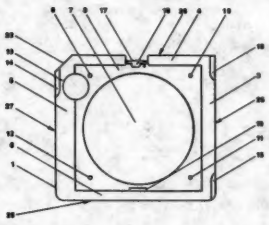
a plurality of trays mounted pivotably on said base, said trays pivoting from an inoperative position having one of said plurality of trays in juxtaposition with said base with the remaining ones of said plurality of trays being in juxtaposition with one another to an operative position with each one of said plurality of trays being spaced from one another and extending in a direction substantially transverse to said base to define a plurality of bins for holding the sheet like material therein; and

flexible means for connecting each one of said plurality of trays so that as the outermost tray of said plurality of trays pivots from the inoperative position to the operative position the remainder of said plurality of trays pivot therewith from the inoperative position to the operative position.

4,624,557
PHOTOMASK CARRIER AND CONTAINER FOR PHOTOMASK CARRIER

Ray Winn, 11803 Addison St., North Hollywood, Calif. 91607

Continuation of Ser. No. 518,298, Jul. 28, 1983, abandoned. This application Feb. 13, 1985, Ser. No. 701,181
Int. Cl.[4] G03B 27/62
U.S. Cl. 355—75 13 Claims



6. An injection-molded, substantially one-piece photomask carrier including a base having an opening of sufficient size and shape to permit light to pass through in a photolithographic process; means joined to, upstanding from and framing the periphery of said base, said means having sufficient strength to protect and support the edges of a photomask or a photomask-/pellicle combination resting on said base; means formed by injection molding on the periphery of said framing means for engaging said carrier with, and disengaging said carrier from alignment means in a photolithographic device; means projecting inwardly from one of said framing means for engaging a first portion of the periphery of a photomask or a photomask-/pellicle combination between said engaging means and said base, said engaging means being spaced a sufficient distance from said base to permit a photomask whose periphery is between said engaging means and said base to tilt away from said base without disengaging said first portion from said engaging means; means on the side of said base opposite said engaging means for movably engaging with, and disengaging from a second portion of the periphery of said photomask or said photomask/pellicle combination and, in combination with said engaging means, for holding said photomask or photomask/pellicle combination on said base; said carrier having a plurality of areas of substantially differing thicknesses precisely formed during injection molding, and a plurality of areas that are substantially flat, formed during said injection molding.

4,624,558
MICROIMAGE RECORDER

Delmar R. Johnson, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 15, 1985, Ser. No. 787,812
Int. Cl.[4] G03B 27/30
U.S. Cl. 355—100 32 Claims

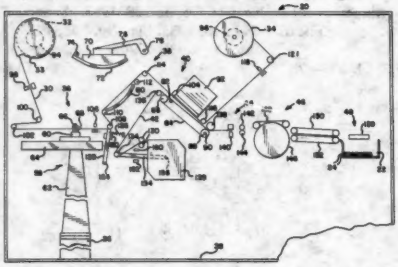
1. In a microimage recording apparatus of the type including exposure, master developing and duplication stations along a master film strip path and means for presenting duplicate film at the duplication station for the exposure of a microfiche array of images on the duplicate film from images on the master film, the improvement comprising:

drive means for moving the master film strip along the master film strip path;

an optics assembly at the exposure station for holding the master film strip stationary and for sequentially projecting numerous discrete light images in an array of rows and columns onto an image area of the master film;

means at the master developer station for heating an image area of the master film strip to simultaneously develop the entire array of exposed images in the image area; and

means at the duplication station for transferring onto the duplicate film as exposed images the entire array of ex-



posed and developed images from a master film strip image area.

4,624,559

DEVELOPING METHOD FOR ELECTROSTATIC LATENT IMAGE

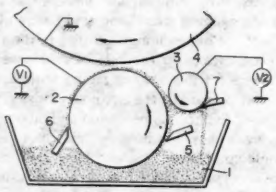
Satoshi Haneda; Masahiko Itaya, and Makoto Tomono, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 736,393, May 17, 1985, abandoned, which is a continuation of Ser. No. 435,105, Oct. 18, 1982, abandoned. This application Feb. 10, 1986, Ser. No. 828,574

Claims priority, application Japan, Oct. 20, 1981, 56-167705

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—14 D **27 Claims**



1. In a developing method for an electrostatic latent image comprising the steps of forming a layer of developer on the surface of a developer supporting means, and conveying the developer on said developer supporting means to a development area, the improvement which comprises regulating the quantity of developer on said developer supporting means by a developer regulating means before the developer is conveyed to the development area, by impressing a bias voltage so as to establish a field between said developer supporting means and said developer regulating means for selectively removing developer from said developer supporting means in accordance with a charged state of said developer, and developing an electrostatic latent image by applying developer retained on said developer supporting means to the development area.

4,624,560

CAPSULE RUPTURE PRINTING SYSTEM

Jack Beery, Fremont, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Oct. 25, 1985, Ser. No. 791,179

Int. Cl.[4] G03B *27/32, 27/52;* G03C *1/72*

U.S. Cl. 355—27 **10 Claims**

1. Apparatus for forming an image on an image-receiving sheet by the rupture of at least some dye-containing capsules of a layer of capsules, comprising:

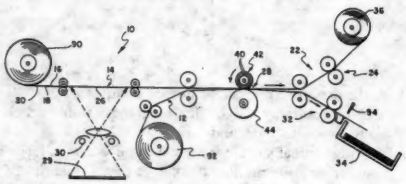
means forming a transfer station;

means for moving said image-receiving sheet past said transfer station;

a flexible backing sheet which has front and rear faces;

means for moving said backing sheet past said transfer station with said front face of said backing sheet facing said image-receiving sheet and said image-receiving sheet supported to resist deflection away from said backing sheet at said station;

said layer of capsules lying on one of said sheets, on a face thereof that faces the other sheet, so the layer of capsules lies sandwiched between said sheets at the transfer station;



said layer of capsules including rupturable dye-containing capsules lying within an image-containing area within which the image-to-be formed lies;

means for resiliently applying pressure at an instant, to at least one small area of the rear face of said backing sheet which is spaced from any other small area on the rear face of said backing sheet to which said pressure is simultaneously being applied, in an amount of pressure which ruptures rupturable capsules lying opposite the small area, wherein each small area has an area less than one hundredth square inch, and at other times similarly applying said pressure to other spaced small areas until the total of said small areas cover substantially all of the area of said backing sheet which lies opposite the image-containing area.

4,624,561

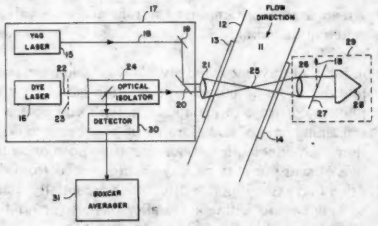
VIBRATION-FREE RAMAN DOPPLER VELOCIMETER

Reginald J. Exton, Williamsburg, Va., assignor to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Adminstration, Washington, D.C.

Filed Apr. 25, 1985, Ser. No. 727,034

Int. Cl.[4] G01P *3/36;* G01J *3/44*

U.S. Cl. 356—28.5 **14 Claims**



1. A method for utilizing stimulated Raman gain spectroscopy to make measurements in a flow volume comprising the steps of:

combining a pump laser beam and a probe laser beam on one side of said flow volume;

focusing the combined beams to a point in said flow volume;

intercepting the combined beams on the other side of said flow volume and reflecting said probe beam back to said point in said flow volume; and

detecting on said one side of said flow volume the resulting light at said point in said flow volume whereby the measurements of the detected light are unaffected by vibration environments.

4,624,562

SIGNAL GENERATOR FOR ALIGNING OPTICAL FIBERS

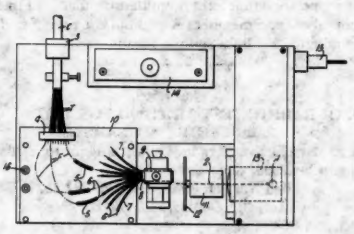
John S. Buck, Widnes, and David Owens, Farnworth, Nr. Widnes, both of England, assignors to BICC Public Limited Company, London, England

Filed Apr. 4, 1985, Ser. No. 719,710

Claims priority, application United Kingdom, Apr. 5, 1984, 8408824

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—73.1 7 Claims



1. A signal generator for injecting a signal simultaneously into a multiplicity of optical fibers comprising an incandescent light source; at least one optical element for deriving from the source a light beam which will extend in a substantially rectilinear direction; means for aligning ends of a plurality of optical fibers with the direction of the beam and positioning them within the area of the beam; means for interrupting the beam at a substantially constant frequency to injet simultaneously a pulsed optical signal into all the said optical fibers.

4,624,563

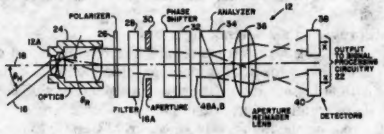
WIDE FIELD OF VIEW REMOTE LASER POSITION SENSOR

John L. Johnson, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1983, Ser. No. 558,000

Int. Cl.[4] G01C *1/00;* G01J *4/00*

U.S. Cl. 356—152 7 Claims



1. A remote laser sensor system for processing incoming directional optical energy comprising: first and second optical sensors disposed adjacently in parallel arrangement for detecting impinging optical energy; each of said sensors comprising a polarizer, a spectral line filter, an internal aperture, a phase shifter, a polarization analyzer, a reimaging lens system, and a pair of detectors; and each of said sensors being disposed for directing impinging optical energy sequentially through said polarizer, filter, internal aperture, phase shifter, analyzer and lens system to said detectors; and the outputs of said detectors being electrical outputs responsive to impinging optical energy for defining the angle of incidence of said optical energy.

4,624,564

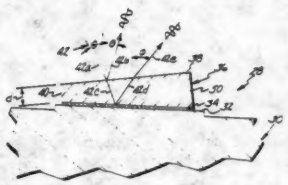
CALIBRATION STANDARDS FOR FLYING HEIGHT TESTERS

Robert P. Dahlgren, Minneapolis, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 1, 1985, Ser. No. 718,311

Int. Cl.[4] G11B *5/60*

U.S. Cl. 356—243 3 Claims



1. Calibration standard for calibrating flying height testers by simulating predetermined flying characteristics of magnetic heads comprising: a substrate; a reflective layer supported by a surface of said substrate; a transparent layer disposed over said reflective layer, said transparent layer having an upper surface arranged at an acute angle to said reflective layer, said acute angle representing a predetermined flying angle of magnetic heads over a disk; and optical reference means carried by said transparent layer on said upper surface a finite distance from said reflective layer as measured perpendicular to the upper surface, said finite distance representing a predetermined flying height of a magnetic head over a disk.

4,624,565

DEVICE FOR GUIDING THE SAMPLE FLOW IN AN ANALYZER

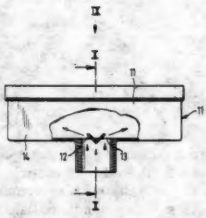
Kauko E. Kiminkinen, Espoo, Finland, assignor to Outokumpu Oy, Espoo, Finland

Filed Sep. 7, 1984, Ser. No. 648,758

Claims priority, application Finland, Sep. 16, 1983, 833321

Int. Cl.[4] G01J *3/30;* G01N *21/72*

U.S. Cl. 356—315 8 Claims



1. A burner device for a flame reaction analyzer, comprising wall means defining at least one inlet port for combustion gas, a burner outlet port, and a passageway for conducting a flow of combustion gas from the inlet port to the burner outlet port, and the device also comprising means for introducing material to be analyzed into the flow of combustion gas, and a flow divider located in said passageway at a position upstream, with respect to the flow of combustion gas, of the burner outlet port and downstream of said means for introducing material, said flow divider comprising two substantially planar elements connected together in a V-shape with the point of the V di-

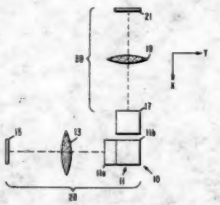
rected away from the burner whereby the flow divider is concave towards the burner.

4,624,566

SPECTRAL ANALYZER AND DIRECTION INDICATOR

Gordon A. Shifrin, Malibu, and Jerome M. Welner, Manhattan Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 12, 1985, Ser. No. 722,973
Int. Cl.[4] G01J *3/28;* H01J *40/14*
U.S. Cl. 356—326 **10 Claims**



5. A spectral analyzer and direction indicator for receiving collimated or essentially collimated incident radiation comprising:

a first optical channel responsive to the collimated or essentially collimated incident radiation for providing detected information for identifying as to the collimated or essentially collimated incident radiation a first angular incidence direction and the spectral content; and

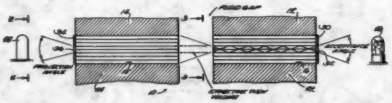
a second optical channel responsive to the collimated or essentially collimated incident radiation for providing detected information for identifying as to the collimated or essentially collimated incident radiation a second angular incidence direction.

4,624,567

FLUID PARTICLE SENSOR

Scott M. Dick, Alta Loma, and Edward F. Patterson, Redlands, both of Calif., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Apr. 11, 1984, Ser. No. 599,007
Int. Cl.[4] G01N *15/02*
U.S. Cl. 356—335 **16 Claims**



1. A fluid particle sensor for measuring and counting particles contained in a fluid, said fluid particle sensor comprising

a first bundle of generally parallel elongated light transmitting members, said first bundle of light transmitting members having a longitudinal axis and opposite inside and outside ends, said members each having a longitudinal axis and opposite end surfaces transverse to said longitudinal axis, and each of said members transmitting light along the length thereof, with light rays being able to enter said members only through said end surfaces and only within a predetermined acceptance angle measured from said longitudinal axis, and with light rays being able to exit said members only through the end surface opposite the end surface through which the light rays entered and only within a predetermined projection angle measured from said longitudinal axis,

a second bundle of generally parallel elongated light transmitting members, said second bundle having a longitudinal axis and opposite inside and outside ends,

means for supporting said first and second bundles such that the longitudinal axes of said first and second bundles are approximately colinear, and such that said inside end of said second bundle is closely spaced apart from said inside end of said first bundle to form a gap through which the particle containing fluid flows,

means for transmitting light to said outside end of said first bundle,

means for sensing the amount of light emitted from said outside end of said second bundle,

a first mask plate abutting and covering said outside end of said first bundle, said first mask plate including a first aperture such that light is transmitted from said light transmitting means to at least one of, but not all of, said member at said otuside end of said first bundle, and

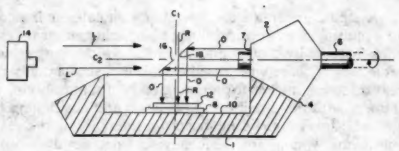
a second mask plate abutting and covering said outside end of said second bundle, said second mask plate including a second aperture which is the same size as said first aperture and such that light is emitted from at least one of, but not all of, said members at said outside end of said second bundle to said light sensing means.

4,624,568

HOLOGRAPHIC TEST METHOD FOR ROTATIONAL EFFECTS ON GEARS

Mark E. Bartolomeo, Vernon, Conn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 11, 1985, Ser. No. 722,232
Int. Cl.[4] G03H *1/30;* G01B *9/21*
U.S. Cl. 356—347 **3 Claims**



1. A holographic method for determining dynamic rotational stress characteristics between a first and second gear pair having mutually orthogonal central rotational axis, said method including the steps of:

(a) mounting a holograhic recording medium for synchronized rotation with said first gear about the central rotational axis thereof;

(b) providing a pulsed collimated light beam source,

(c) illuminating the second gear with the light beam of step (b) to provide an object beam of reflective light therefrom in a direction substantially parallel to the rotational axis thereof,

(d) providing a reference light beam,

(e) providing means for directing the reference and object light beams towards the holographic medium of step (a) with at least said object light beam in a direction substantially parallel to the rotational axis of said first gear,

(f) exposing the holographic medium of step (a) to the reference and object light beam of step (e) at a first rotational condition of said first and second gears,

(g) exposing the holographic medium of step (f) to the reference and object light beams of step (e) at a second rotational condition of said first and second gears,

(h) developing the holographic medium of step (g), and

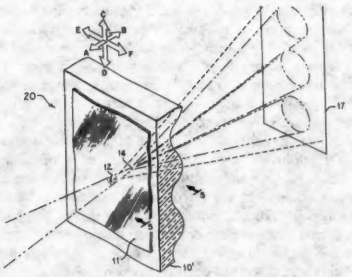
(i) viewing the developed holographic medium of step (h) for differences between the exposures of steps (f) and (g) under the criterion that optical interference lines arising from said differences are indicative of the dynamic rotational stress characteristics of said first and second gears.

4,624,569

REAL-TIME DIFFRACTION INTERFEROMETER

Osuk Y. Kwon, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jul. 18, 1983, Ser. No. 514,875
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—354 18 Claims



1. Apparatus for monitoring quality of an optical beam wavefront, said apparatus comprising:

(a) converging means for bringing said beam to a focus;

(b) separating means positionable in said beam downstream of said converging means, said separating means being only partially transparent to said beam except for a pinhole-apertured portion of said separating means that is substantially transparent to said beam, said separating means comprising homogeneous diffraction grating means of uniform grating period for causing a first portion of said beam to be separated into a plurality of components, said components of said first portion of said beam being of different phases with respect to each other, said pinhole-apertured portion of said separating means defining an aperture that is dimensioned to function as a point diffraction means for causing a second portion of said beam to be transmitted with a substantially spherical wavefront, said second portion of said beam undergoing interference with each of said components of said first portion of said beam; and

(c) detecting means positionable downstream of said separating means, said detecting means separately indicating the interference of each of said components of said first portion of said beam with said second portion of said beam.

4,624,570

FIBER OPTIC DISPLACEMENT SENSOR

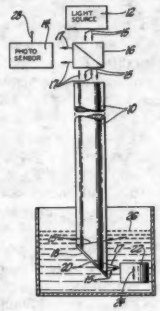
Gary P. Bertollini, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1984, Ser. No. 646,147
Int. Cl.[4] G01B 11/14
U.S. Cl. 356—373 3 Claims

1. A fiber optic displacement sensor for monitoring displacement of an object parallel to the optical fiber axis comprising,

light source and detector means,

optical fiber means extending from the light source and detector means to a position adjacent the object being monitored, the optical fiber means having an end treatment including a fiber end surface slanted with respect to the fiber axis and coated with reflective material so that the path of light transmitted to the object from the source is reflected from the slanted end surface and directed laterally through a wall of the fiber means towards the object and the light is attenuated by the object as a function of the object position and returned along a similar light path to the detector means, the light intensity received at the detector means being a measure of the object position in the light path.

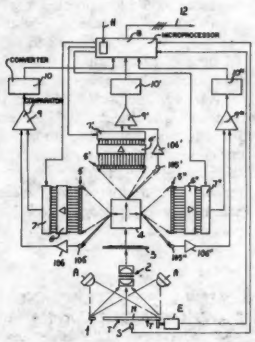


4,624,571

APPARATUS FOR DETECTING THE COLORING OF MOVING FLAT-SHAPED BODIES

Luciano Salda, Vignola; Daniele Pasqui, and Gianni Mantovani, both of Bologna, all of Italy, assignors to M.S. Sistemi Automatici S.r.l., Vignola, Italy

Filed Sep. 13, 1984, Ser. No. 650,036
Claims priority, application Italy, Sep. 21, 1983, 12625 A/83
Int. Cl.[4] G01J 3/50
U.S. Cl. 356—406 4 Claims



1. An apparatus for detecting the coloring, even of composite formation, of a moving object, such as tiles, and comparing the detected information with coded information corresponding to an ideal coloring of said object by processing different signals dependent upon the detected differences, wherein said signals may be used for dividing a flow of said objects into different flows as a function of the quality of their color, said apparatus comprising the following components:

(a) a lens (2) directed toward an object to be scanned, said object being illuminated by light sources (A) and translated in proximity to said lens;

(b) a light filter (3) located downstream of said lens to balance a detected light spectrum according to the colorimetric response of the human eye;

(c) a separator unit (4), comprising means to spread out light information issued from said filter into primary colors;

(d) a stationary flat-shaped reference body (1) of a pre-established color, arranged beside an object to be scanned,

co-planar therewith and suitably spaced therefrom so as to be in the field of vision of said lens, said body also being illuminated by said light sources (A);

(e) three banks of photoelectric sensors (5-5'-5") each of which is reached by monochromatic light information issued from said separator unit (4), each of said banks consisting of a plurality of solar cells arranged side by side and aligned to form a rectilinear arrangement, at least one further respective solar cell (105-105'-150") reached by said monochromatic light information concerning said reference body (1) being provided at a proper distance from said arrangement and for each arrangement;

(f) means (6-106, 6'-106', 6"-106") for amplifying the low electrical levels from said photoelectric sensors, so as to adapt them for processing by successive processing means;

(g) means (9-9'-9" and 7-7'-7") for comparing the electric signals from said photoelectric sensors which are responsive to the light information from said object to be scanned, with the electric signal from said sensor reached by the light information from said reference body (1), the arrangement being such that the electric output signal from said comparing means may vary only due to an actual variation of the color of said object being scanned and not due to thermal drifts in the electronic components of the reading unit to variations in the illumination level of said object;

(h) means (10-10'-10") for converting an analogic output signal from said comparing means into a corresponding digital signal;

(i) a microprocessor (8) having memorized and coded therein the information concerning the coloring to be presented by said object to be scanned and which is compared with the processed information from said converters, the arrangement being such that, depending upon the detected differences, said microprocessor will emit different electric signals that may be used to control the division of the flow of the objects being scanned as a function of the quality of their coloring; and

(j) means (S) for detecting the beginning and the end of each object to be scanned, and means (E) for detecting the speed of advance of said object and which emits electrical signals with a cadence depending upon said speed, the arrangement being such that the signals from said means will reach said microprocessor (8) to activate it cyclically and to synchronize the comparison of the coded information with the information progressively reaching said microprocessor through said converters.

4,624,572

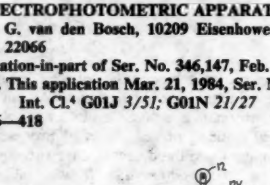
NON-INVASIVE REFLECTANCE SPECTROPHOTOMETRIC APPARATUS

Francois J. G. van den Bosch, 10209 Eisenhower La., Great Falls, Va. 22066

Continuation-in-part of Ser. No. 346,147, Feb. 5, 1982, abandoned. This application Mar. 21, 1984, Ser. No. 591,831

Int. Cl.[4] G01J *3/51*; G01N *21/27*

U.S. Cl. 356—418 **9 Claims**



1. Apparatus for detecting spectrophotometric characteristics of a specimen, comprising;

a portable housing;

a light source for emitting radiation and mounted within said housing;

means for producing monochromatic light from said emitted radiation;

means for transmitting said monochromatic light to irradiate said specimen therewith; and

photosensitive detector means responsive to the monochromatic light reflected from said specimen to provide output signals representative of the spectrophotometric characteristics of said specimen, and including light responsive means responsive to said reflected light and having an impedance characteristic variable in response thereto, a bridge circuit having a first arm including a first solid state device responsive to said variable impedance characteristic to generate a first amplified output, signal representative of said spectrophotometric characteristics, a second solid state device connected in a second arm of said bridge and responsive to said first amplified output signal to produce a second output signal representative thereof, means connected in a third arm of said bridge for calibrating said bridge and connected to said first solid state device, resistance means connected in the fourth arm of said bridge and connected to said second solid state device, whereby said second output signal represents the spectrophotometric characteristics of said specimen.

4,624,573

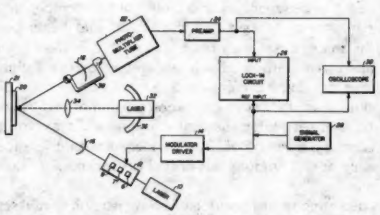
TOTAL OPTICAL LOSS MEASUREMENT DEVICE

John P. Rahn, 22420 Gilmore, Canoga Park, Calif. 91307, and C. Denton Marrs, 414 Ashworth, Ridgecrest, Calif. 93555

Filed May 14, 1984, Ser. No. 609,942

Int. Cl.[4] G01N *21/55*

U.S. Cl. 356—445 **6 Claims**



1. A device for measurement of optical loss of an optical element; the device comprising:

an optically resonant cavity defined by an entrance mirror and an exit mirror and having a predetermined optical path therebetween;

means for mounting the sample optical element within said cavity and in said path;

means for emitting a beam of coherent light modulated with a predetermined input signal into the cavity through the input mirror and along said path;

monitoring means, which receives said beam after exit from the cavity through the exit mirror, for generating an output signal corresponding to the modulation of said beam after such optical loss at the sample element;

measureement means for comparing said output signal with said input signal to evaluate said optical loss; and periscope means at

the exit mirror for directing light to said monitor means without resonance between the entrance mirror and the exit mirror, the periscope means being removable for resonant operation of the cavity and being emplaceable therein to receive said beam along said path between the sample element and the exit mirror and to bypass the beam around the exit mirror and to said monitor means for calibration of said monitor means and said measureemnt means.

4,624,574

APPARATUS FOR PRODUCING AERATED CEMENTITIOUS COMPOUNDS

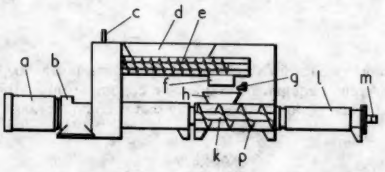
Peter S. Mills, Burton-on-Trent, and Ivor K. Daly, Melbourne, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed May 4, 1984, Ser. No. 607,805

Claims priority, application United Kingdom, May 5, 1983, 8312326

Int. Cl.[4] B28C 5/06

U.S. Cl. 366—13 6 Claims



1. Apparatus for producing an aerated cementitious composition, comprising a mixing chamber being open to atmosphere, feed means for feeding ingredients comprising cement, foaming agent and liquid to the mixing chamber, mixing means disposed with the mixing chamber for mixing ingredients fed to the mixing chamber and pump means for pumping the mixed ingredients to a desired site and for drawing air into the mixing chamber, the rated pumping capacity of the pump means being greater than the feed rate of ingredients to the mixing chamber such that in operation air is entrained in the mixed ingredients, and control means, connected to the feed means, for controlling the feed rate wherein the feed rate of at least a portion of the feed means can be varied, wherein the feed means comprises a drive conveyor for feeding a mixture comprising cement and foaming agent to the mixing chamber and nozzle means for feeding liquid to the mixing chamber, and wherein the mixing means comprises a screw conveyor arranged to urge the mixed ingredients towards the pump means, and wherein the feed means, the mixing means and the pump means are driven from a common drive motor.

4,624,575

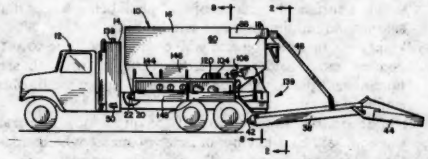
CEMENT MOBILE MIXER

Alpheus D. Lantz, Morgantown, Pa., assignor to Lantz Construction Company, Morgantown, Pa.

Filed Aug. 30, 1985, Ser. No. 771,506

Int. Cl.[4] B28C 7/04

U.S. Cl. 366—16 10 Claims



1. A cement mobile mixer including a sand and aggregate hopper; a discharge chamber at one end of the hopper; a belt running along the bottom of the hopper with the downstream end of the belt extending into the chamber for delivery of sand and aggregate to the chamber; concrete mixing means below the chamber; a cement hopper above the chamber; cement delivery means in the bottom of the cement hopper for delivery of cement into the chamber; a water tank, a water pipe extending between the tank and chamber; a water pump for flowing water from the tank through the pipe and into the chamber whereby sand and aggregate, cement and water delivered to the chamber fall into the mixing means; a hydraulic system having a first variable speed hydraulic drive means for moving the belt downstream to deliver sand and aggregate to the chamber at an adjustable rate; a second variable speed hydraulic drive means for operating the cement delivery means to deliver cement to the chamber at an adjustable rate; a third variable speed hydraulic drive means for operating the water pump to deliver water to the chamber at an adjustable rate, a source of high pressure hydraulic fluid, a first adjustable valve connected between the source and the first hydraulic drive means, a second adjustable valve connected between the source and the second hydraulic drive means, a third adjustable valve connected between the source and the third hydraulic drive means whereby said valves may be independently adjusted so that the belt, cement delivery supply means and pump deliver sand and aggregate mix, cement and water to the chamber at rates dependent upon the requirements of a given concrete mix; first detector means for generating a first signal proportional to the rate of delivery of sand and aggregate to the chamber by the belt; second detector means for generating a second signal proportional to the rate of delivery of cement to the chamber by the cement delivery means; and first and second detectors mounted on the mixer in positions to be observed by the operator and responsive respectively to the first and second signals so that an operator may observe the detectors and the mixed concrete and adjust said valves during operation of the mixer to maintain the proper concrete mix.

4,624,576

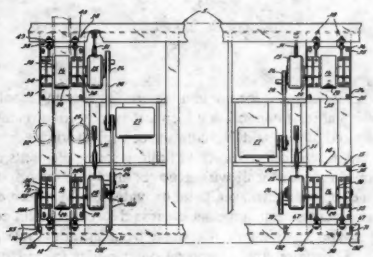
ADJUSTMENT OF DRUM MIXER TRUNNIONS

Bruce A. Dillman, Cape Coral, Fla., assignor to Bituma Construction Equipment Company, Marquette, Iowa

Filed Jun. 26, 1985, Ser. No. 749,316

Int. Cl.[4] B28C 5/18

U.S. Cl. 366—63 8 Claims



1. In combination with a drum mixer comprising a rigid frame that is elongated in a fore-and-aft direction, an axially elongated drum that has a drum axis and is encircled by coaxial front and rear trunnion engaging rings, and two pairs of trunnion units, one pair for each said ring, whereby the drum is driven for rotation and is supported above a top surface of the frame and between opposite sides thereof with its axis extending substantially in said direction, the two trunnion units of each pair being at opposite sides of the drum axis, and each said trunnion unit having front and rear ends which are spaced apart substantially in said direction and comprising a base member which is slidingly shiftable on said top surface transversely to said fore-and-aft direction and which carries a roller that supportingly and drivingly engages its ring, said roller being confined to rotation relative to the base member about a roller axis that extends through said front and rear ends, means for facilitating accurate adjustment of the positions of the trunnion units comprising:

A. means on each trunnion unit defining a pair of holes that are coaxial with said roller axis of the trunnion unit, one of said holes opening to the front end of the trunnion unit and the other to its rear end;

B. a pair of locating fixtures fixed on the frame, both adja-

cent to one side thereof, there being one of said locating fixtures for each pair of trunnion units, and each said locating fixture having

(1) front and rear end surfaces that are substantially aligned with the front and rear ends, respectively, of the trunnion units of its pair, and

(2) a hole opening to each of said end surfaces, the axes of said holes in both locating fixtures coinciding with a single line extending in said fore-and-aft direction; and

C. at least one substantially U-shaped gage having

(1) an elongated body portion

(2) a tang projecting laterally from the body portion at each end thereof, each said tang being closely slidably receivable in each of said holes, and

(3) means on said body portion for adjustably varying the distance between said tangs.

4,624,577

SCREW ELEMENT FOR A MATERIAL PROCESSING MACHINE

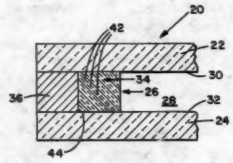
Jean Vannier, Etang sur Arroux, and Francis Mourrier, Autun, both of France, assignors to Clextral, Paris, France

Filed Mar. 18, 1985, Ser. No. 713,111

Claims priority, application France, Mar. 16, 1984, 84 04055

Int. Cl.[4] B29B *1/10*

U.S. Cl. 366—83 **10 Claims**



1. A screw element for use in a material-processing machine comprising at least one screw which is driven in rotation inside an elongated sleeve and including a central driving shaft on which are mounted a plurality of hollow screw elements provided on their inner wall with grooves engaging corresponding splines on the central shaft and provided on their periphery with material-processing means, each said screw element comprising a cylindrical inner collar made from a product resisting mechanical driving stresses and an outer collar made from a product capable of resisting abrasion of the processed material, said inner collar and said outer collar being symmetrical relative to a median plane perpendicular to the axis of said shaft, and said inner collar having a length less than the length of said outer collar so as to define at both ends of said screw element two semi-grooves having a height equal to the thickness of said inner collar, so that confronting semi-grooves of two adjoining screw elements define a circular recess for a sealing gasket interposed between said adjoining screw elements.

4,624,578

RENTAL CONTRACT TIMER SYSTEM

David L. Green, 18340 Cutlass Dr., Ft. Myers Beach, Fla. 33931

Filed Dec. 2, 1985, Ser. No. 803,218

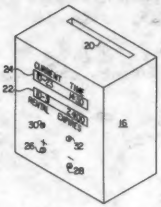
Int. Cl.[4] G04B *47/00*

U.S. Cl. 368—10 **20 Claims**

1. A rental contract timer system for permitting the operation of rental equipment only during a rental period encoded on a medium which may be encoded at a remote location comprising:

decoding means for decoding said encoded medium;

switching means for putting said rental equipment in operable and inoperable conditions; and



computer means for directing said switching means to put said rental equipment in operable condition only during the rental period as decoded by said decoding means.

4,624,579

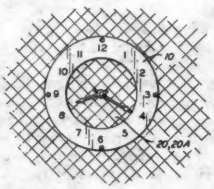
IN-THE-WALL CLOCK

Everett W. Forman, 4107 Eldorado Cove, Bradenton, Fla. 33507

Continuation of Ser. No. 746,935, Jun. 20, 1985, abandoned, which is a continuation of Ser. No. 504,610, Jun. 15, 1983, abandoned. This application Oct. 23, 1985, Ser. No. 790,764

Int. Cl.[4] G04C *23/02*; G04B *19/04*

U.S. Cl. 368—88 **1 Claim**



1. An in-the-wall clock comprising, in combination:

(a) a housing containing a clock mechanism, said housing having a pair of clock handshafts protruding in a given direction from a front surface thereof, said front surface of said housing having a given maximum dimension, in a direction perpendicular to said given direction,

(b) said housing being mounted in a wall with said front surface of said housing being substantially coplanar with said wall and said handshafts protruding out from the surface of said wall,

(c) a plate having a handshaft hole in the center thereof, the smallest surface dimension of said plate being larger than said maximum dimension of said housing,

(d) said plate mounted on said wall over said housing so as to conceal same, said handshafts protruding through said hole in said plate, the front surface of said plate finished similarly to said wall,

(e) a decorative ring, optionally having clock numerals thereon, said ring having an inner diameter which is less than the smallest surface dimension of said plate, and an outer diameter which is equal to, or greater than, the largest surface dimension of said plate,

(f) said ring being mounted onto said wall concentric to said handshafts so as to conceal the edge or edges of said plate, and

(g) a pair of clock hands attached to said respective handshafts,

whereby said plate will conceal said housing and said ring will conceal the edge or edges of said plate, so that said plate, when the surface is finished similarly to a wall, will appear to be a part of the surface of said wall, and

it will appear that siad clock was preconstructed in said wall.

4,624,580

TWISTING PENDULUM OPERATING APPARATUS

Hisaji Sagawa, Tokyo, Japan, assignor to Nisshindo Company, Ltd., Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 702,216
Claims priority, application Japan, Jun. 22, 1984, 59-93550[U]
Int. Cl.⁴ G04B *15/00, 19/00*
U.S. Cl. 368—134 **9 Claims**

1. A twisting pendulum operating apparatus, comprising:
a suspension wire having a first end for being fixed to a support and a second end opposite said first end for being fixed to a pendulum, for suspending the pendulum from the support;
a rotary shaft having a longitudinal axis and having means for engaging the gears of a clock for rotating said shaft about said axis;
a rotor, fixedly secured to said shaft so as to rotate therewith;
an idle wheel having protrusions along an outer circumference thereof, idly fitted to said shaft;
means, including permanent magnets on at least one of said idle wheel and said rotor, for magnetically urging said idle wheel to said rotor such that said idle wheel is rotated with said rotor; and
a connecting piece fixed to said suspension wire intermediate said first and second ends so as to be releasably engage said protrusions, one-by-one, as said idle wheel rotates with rotation of said rotor, thereby to twist said suspension wire.

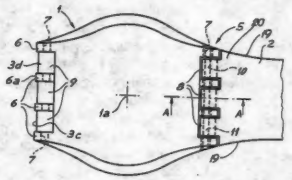
4,624,581

WRIST WATCH HAVING A BRACELET ATTACHED TO THE WATCH CASING BY A HINGE

Elmar Mock, Bienne, and Alphonse Bron, Bassecourt, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Continuation of Ser. No. 722,986, Apr. 15, 1985, Pat. No. 4,561,077, which is a continuation of Ser. No. 498,822, May 27, 1983, abandoned. This application Aug. 26, 1985, Ser. No. 769,128
Claims priority, application Switzerland, Jun. 11, 1982, 3620/82
Int. Cl.⁴ G04B *37/00*
U.S. Cl. 368—282 **11 Claims**

1. A wrist watch including:
(a) a casing made of plastics material;
(b) two bracelet halves also made of plastics material;
(c) a pair of hinges each for attaching one of said bracelet halves to said casing, each said hinge having a geometrical pivot axis and comprising two first elements on the casing and a second element on said respective bracelet half, aligned holes being provided in said first and second elements; each hinge further comprising:
(d) an axis member inserted in said holes;
(e) abutment means defining first and second end positions of rotation of said bracelet half with respect to said casing, said positions being spaced a predetermined angle apart from each other;
(f) a cover portion integral with the casing and connecting said first elements of said hinge together so as to cover said second element;
(g) said second element having a cylindrical surface coaxial with said geometrical pivot axis;
(h) the radius of said cylindrical surface of said second element being substantially equal to the distance between



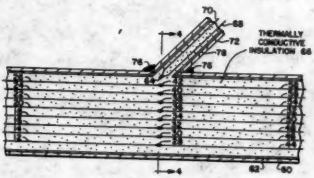
said axis and the edge of said cover portion remote from said casing, said cylindrical surface extending over an angular sector at least equal to the angle with which said end positions are spaced apart;
(i) said cylindrical surface portion being integral with the upper surface of the bracelet half in a region located on the side of said axis opposite to said casing, the thickness of said region decreasing towards the end of said bracelet half opposed to said hinge.

4,624,582

MULTI-WIRE MINERAL INSULATED CABLE THERMOCOUPLE REFERENCE JUNCTION

Lionel A. Banda, 43 Oakwood Dr., South Windsor, Conn. 06074, and Thomas J. Devon, 27 Pinney Rd., Bloomfield, Conn. 06002

Filed Feb. 29, 1984, Ser. No. 584,840
Int. Cl.⁴ G01K *7/02, 7/10*
U.S. Cl. 374—181 **29 Claims**



1. Cable means for making a transition from leads of a temperature measuring means to extension wires that conduct a signal indicative of the temperature measured by the temperature measuring means to signal processing electronics, comprising:
(a) a cable sheath;
(b) a low resistance, electrically conductive liner means disposed coaxially within the sheath for defining a shielded region within the interior of the liner means and for shielding the interior region from electromagnetic radiation;
(c) a pair of leads extending from a temperature measuring means to within the shielded region within the interior of the liner means;
(d) a pair of extension wires extending from within the shielded region within the interior of the liner means to signal processing electronics;
(e) a plurality of intermediate junctions disposed in the shielded region and formed at the juncture of the leads of the temperature measuring means and the extension wires;
(f) thermally conductive, electrically insulating means for

filling the shielded region at least through the region of the intermediate junctions and for conducting thermal energy from the conductive liner means throughout the thermally conductive, electrically insulating means in the region of the intermediate junctions such that no temperature gradient exists across the radius of the liner means; and

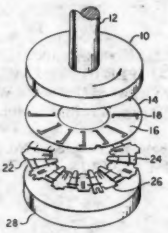
(g) a compensating temperature measuring means having leads, the compensating temperature measuring means disposed within the sheath in the region of the intermediate junctions for measuring the temperature of the intermediate junctions and for generating a signal indicative of the temperature of the intermediate junctions, said signal impressed on the leads thereof, whereby the signal indicative of the temperature of the intermediate junctions generated by the compensating temperature means is available to compensate a signal indicative of the temperature measured by the temperature measuring means as conducted on the extension wires due to the thermoelectric effect of the intermediate junctions.

4,624,583

FOIL THRUST BEARING

Marshall P. Saville, Lawndale, and Alston L. Gu, Rancho Palos Verdes, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 1, 1984, Ser. No. 656,398
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—105 **64 Claims**



1. A fluid thrust bearing comprising:

a pair of members arranged for relative rotation with respect to one another, one of said pair of members adapted to rotatably support the other; and

a compliant foil bearing operably disposed between said pair of relatively rotatable members and mounted to one of said pair of relatively rotatable members, said complaint foil bearing comprising a thrust disk having a plurality of integral, converging surface compliant foils and a plurality of diverging surface ramps disposed generally between the integral, converging surface compliant foils, said diverging surface ramps comprising an inner ramp and an outer ramp separated by a radial slot in the thrust disk.

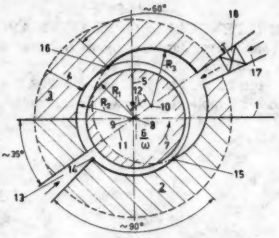
4,624,584

SLIDING JOURNAL BEARING

Robert Odermatt, Brüttisellen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 12, 1984, Ser. No. 619,990
Claims priority, application Switzerland, Jul. 1, 1983, 3624/83
Int. Cl.[4] F16C *3/04, 32/06*
U.S. Cl. 384—114 **2 Claims**

1. A sliding journal bearing, comprising a bearing bore having a bearing sliding surface for hydrodynamic lubricant wedge formation formed from first and second parallel cylinders that have first and second bearing axes separated by a predetermined distance in a diametral plane, at least one first and at least one second oil supply holes provided, respectively, underneath and above a horizontal dividing plane at right angles to a direction of a load through the first bearing axis, and inlets of the oil supply holes being displaced at an angle of



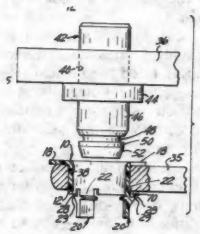
at least approximately 35° relative to the horizontal dividing plane in a direction of rotation of a shaft located inside the cylinders.

4,624,585

RETAINER BUSHING

Richard A. Nix, Utica, and Thomas J. Kudzia, Troy, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Continuation of Ser. No. 578,709, Feb. 9, 1984, abandoned. This application Aug. 9, 1985, Ser. No. 764,241
Int. Cl.[4] F16B *33/04, 33/22, 35/02*
U.S. Cl. 384—296 **2 Claims**



1. Assembly for pivotally coupling a first element having a cylindrical bore to a second element having a cylindrical male member, said assembly comprising a retainer bushing for holding the cylindrical male member of said second element within the cylindrical bore of said first element, said retainer bushing comprising a solid tubular body having a periphery fitting the cylindrical bore of said first element and a cylindrical internal bore accepting the cylindrical male member of said second element, said cylindrical internal bore of said tubular body having a longitudinal axis, a radially extending outwardly directed circular flange integrally formed at an end of said solid tubular body for engaging a surface of said first element at an end of the cylindrical bore of said first element, said circular flange being divided by cut-out portions in at least two substantially identical spaced apart portions disposed in a single plane perpendicular to the longitudinal axis of the cylindrical internal bore of said solid tubular body, at least two flexible tangs substantially aligned each with one of said flange cut-out portions, each of said flexible tangs being elastically deflectable outwardly and inwardly and extending longitudinally at the other end of said solid tubular body and formed integrally at said other end, a pair of notches extending longitudinally part of the way from said other end of said solid tubular body and defining a foot portion for each of said flexible tangs extending partially into said solid tubular body such that each of said flexible tangs is elastically deflectable relatively to said solid

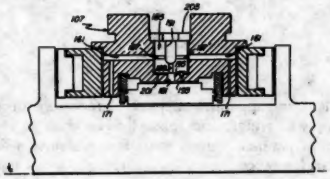
tubular body at said foot portion, the circumferential distance between the tangs being substantially greater than the circumferential width of the notches, each of said flexible tangs having a radially extending outwardly directed abutment surface for engaging a surface of said first element at the other end of the cylindrical bore of said first element and an inwardly radially extending prong, a peripheral groove in said cylindrical male member, each of said flexible tangs having an outward ramp surface causing deflection of each of said flexible tangs upon introduction of said bushing in the cylindrical bore of said first element, whereby said solid tubular body of said bushing is installed in the cylindrical bore of said first element with said flexible tangs elastically deflected inwardly, said flexible tangs being allowed to spring back to their original position whereby said solid tubular body is held in the cylindrical bore of said first element by the radially extending abutment surface of each of said flexible tangs, said flexible tangs being adapted to be outwardly elastically deflectable for introduction of said cylindrical male member into the internal cylindrical bore of said solid tubular body for engagement of the prong of each of said flexible tangs within said peripheral groove in said cylindrical male member, wherein said cylindrical male member has a tapered portion beyond said peripheral groove forming a ramp for progressively deflecting outwardly said flexible tangs by engagement with the prong of each of said flexible tangs during introduction of said cylindrical male member within the cylindrical internal bore of said solid tubular body, and each of said flexible tangs has an end portion projecting beyond said prong for allowing withdrawal of said cylindrical male member from the cylindrical internal bore of said solid tubular body, by outwardly deflecting each of said tangs by outwardly exerting a force on each projecting end portion thereof for disengaging each of said prongs from the peripheral groove of said cylindrical male member.

4,624,586

BEARING LUBRICATION DEVICE

Robert W. Brogan, Westminster, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Mar. 1, 1985, Ser. No. 707,284
Int. Cl.[4] F16C *17/00, 33/10*
U.S. Cl. 384—307 **7 Claims**



1. An improved lubrication device for a combined journal and thrust bearing which includes a base ring having a plurality of spaced apart radially extending fluid feed ports; said base ring further including a plurality of interior passageways connecting the fluid feed ports with journal bearing surfaces and thrust bearing surfaces and wherein the improvement comprises:

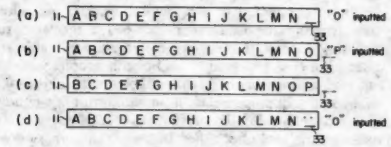
alternative orifice plugs for selective insertion into fluid feed ports; each of said orifice plugs being designed to provide different lubrication flows and pressures to both thrust and journal bearings by selective insertion and removal into the fluid feed ports and without changing interior passageway dimensions.

4,624,587

ELECTRONIC TYPEWRITER WITH REMOVABLE DISPLAY CURSOR

Hideo Ueno, Nagoya; Hiroshi Kuno, Inazawa, and Yoshifumi Hamabe, Chiryu, all of Japan, assignors to Brother Industries, Ltd., Nagoya, Japan

Filed Nov. 7, 1984, Ser. No. 669,263
Claims priority, application Japan, Nov. 19, 1983, 58-218176
Int. Cl.[4] B41J *3/46*
U.S. Cl. 400—83 **1 Claim**



1. An electronic typewriter for printing a line of consecutive characters on a sheet of paper comprising:

a display unit having a number of positions provided to display one of a character and a cursor, the number of positions being less than a maximum number of characters forming said line;

a keyboard with keys for selecting the characters to be printed;

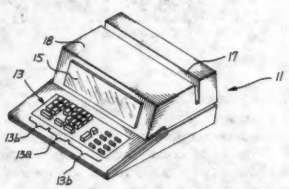
control means operatively connected to said display unit and said keyboard, said control means including circuit means for determining if said cursor is located in the rightward-most position of said display unit, for moving said cursor off the display unit if the next data inputted is character key data and for holding said cursor in the righward-most position if the next data inputted is dead key deadkey data.

4,624,588

FULL FIELD MICR ENCODER

Ken L. Bivin, Seattle, Wash., assignor to Maverick Microsystems, Inc., Seattle, Wash.

Filed Nov. 8, 1983, Ser. No. 549,818
Int. Cl.[4] B41J *5/00*
U.S. Cl. 400—105 **10 Claims**



1. A check encoder apparatus for receiving, transporting, and encoding checks, said encoder apparatus being electronically controlled by programmed instructions, and comprising:

a check guide having a base portion and an upwardly directed opening for feeding a check into said guide, whereby said check is fed into said guide from a position substantially above said guide;

means for sensing the position of said check after said check has been fed through said opening;

means for gripping said check, said gripping means being operatively positioned substantially between said feed opening and said base portion, wherein said gripping means is characterized in that said gripping means is operable between an open and a gripping condition, said gripping means being in an open condition when said check is fed into said guide, said gripping means being operatively connected to said sensing means, wherein said gripping means grips said check in response to a signal from said

sensing means indicating that said check is properly seated adjacent said guide base portion, and further, said gripping means including

two-way drive means for moving said check to a predetermined base position, wherein such position is identified by said sensing means, and after such identification, said two-way drive means is operable to move said check from said base position a preselected distance right or left along said guide base portion, in accordance with electronically programmed check position instructions, and wherein said two-way drive means of said gripping means further includes a fixed roller assembly having at least one roller drivingly connected to a reversible motor, and wherein said gripping means further includes a movable roller assembly having at least one roller, said movable roller assembly being mounted to said check encoder apparatus for pivotal movement about a horizontal axis, so that when said gripping means is in said gripping condition said movable roller is substantially adjacent said fixed roller to grip said check therebetween, and wherein when said gripping means is in said open condition said movable roller is in a position pivoted away from said fixed roller, to permit said check to be fed into said check guide; and

means for encoding said check after said check has been moved said preselected distance.

4,624,589

DOT PRINTER HEAD

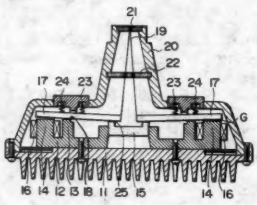
Kuniaki Ochiai; Masami Horii; Shigeo Komakine, and Shinzi Tsuyuki, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,185

Claims priority, application Japan, Mar. 15, 1984, 59-50046

Int. Cl.[4] B41J *3/04*

U.S. Cl. 400—124 **3 Claims**



1. A dot printer head comprising:

(a) a yoke;

(b) an annular bank mounted on said yoke;

(c) a plurality of cores magnetically coupled to said yoke, said plurality of cores forming an annular array around and externally of said annular bank;

(d) a plurality of coils, each one of said plurality of coils being mounted on a corresponding one of said plurality of cores;

(e) a plurality of radially oriented armatures, each one of said plurality of radially oriented armatures being pivoted about a corresponding primary fulcrum on said annular bank;

(f) a plurality of printing needles, each one of said plurality of printing needles being operatively associated with a corresponding one of said plurality of radially oriented armatures;

(g) a stopper positioned to support the radially inner end of each one of said plurality of radially oriented armatures when in its rest position, each one of said plurality of radially oriented armatures being pivotal about a corresponding secondary fulcrum on said stopper;

(h) a plurality of metallic return springs, each one of said plurality of metallic return springs urging an associated one of said plurality of radially oriented armatures to pivot about its primary fulcrum in the return direction and to pivot about its secondary fulcrum in the opposite angular direction; and

(i) a plurality of metallic holding springs, each one of said plurality of metallic holding springs bearing against an associated one of said plurality of radially oriented armatures radially outwardly of its primary fulcrum and urging said associated one of said plurality of radially oriented armatures to pivot about its primary fulcrum in the angular direction opposite to the angular direction in which the associated one of said metallic return springs urges it to pivot and to pivot about its secondary fulcrum in the same angular direction as the angular direction in which the associated one of said plurality of metallic return springs urges it to pivot;

(j) said plurality of metallic return springs and said plurality of metallic holding springs being sized and positioned so that each one of said plurality of metallic holding springs exerts a torque urging the associated one of said plurality of radially directed armatures to pivot abouts its primary fulcrum in the actuating direction that is lower than the torque exerted by the associated one of said metallic return springs urging the associated one of said plurality of radially directed armatures to pivot in the return direction.

4,624,590

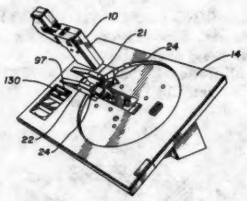
LETTERING APPARATUS

Michael M. Richardson, Scottsdale; Ronald F. Tuckner, Phoenix, both of Ariz., and Douglas A. Schaffer, Inver Grove Heights, Minn., assignors to Kroy Inc., Scottsdale, Ariz.

Continuation of Ser. No. 549,245, Nov. 4, 1983, abandoned. This application Dec. 20, 1985, Ser. No. 811,286

Int. Cl.[4] B41J *1/30*

U.S. Cl. 400—134.6 **14 Claims**



1. A lettering apparatus adapted for receiving a replaceable tape supply cartridge, said apparatus comprising:

a pair of parallel, spaced apart frame members defining a cartridge receiving cavity for receiving said tape supply cartridge;

means for creating a lettering force comprising a print bar pivotally supported between, and about an axis perpendicular to, said frame members and means for resisting force causes by pivotal movement of said print bar;

an elongated drive arm pivotally connected near its lower end between said frame members about an axis generally perpendicular to said frame members and having an upper end adapted for engagement with a tape advancement means within said tape supply cartridge; and

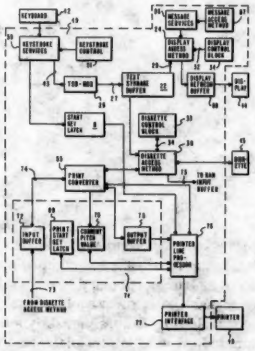
an elongated stop arm pivotally connected near its lower end between said frame members and having an upper end adapted for engagement with a tape advancement means within said tape supply cartridge for limiting the forward movement of said tape advancement means.

4,624,591

IMPACT PRINTER WITH TYPE FONT ELEMENTS HAVING MID-LINE PITCH CHANGE CAPABILITY

Johnny G. Barnes; James L. Gaudet, both of Austin, Tex.; Patrick J. Hurley, Delray Beach, Fla., and Grover H. Neuman, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 505,132, Jun. 16, 1983, abandoned.
This application Feb. 5, 1985, Ser. No. 698,722
Int. Cl.[4] B41J *1/22, 3/58*
U.S. Cl. 400—171 13 Claims



1. In an impact printer system having means for receiving a selected one of a plurality of character font elements having character fonts, the pitch of the character fonts of said elements being different from each other, means for selectively impacting selected characters from said respective fonts along lines in a document and means for controlling the selection of font elements and characters to provide a selected document format,

the improvement wherein said controlling means includes means for controlling printing with at least two font elements of different pitch along a single line, said printing controlling means further including means for receiving format data including a specified pitch value and character data including the selected characters for impacting, pitch register means for storing the specified pitch value, means for providing said character data and said pitch value in said pitch register means to said impacting means, and test means for determining when said format data includes a change in pitch value and for stopping said character data and said pitch value from said pitch register means from being provided to the impacting means until the test means has stored said changed pitch value in said pitch register means.

4,624,592

RIBBON CARTRIDGE RETENTION

Billy D. Purcell, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1984, Ser. No. 617,421
Int. Cl.[4] B41J *32/00*
U.S. Cl. 400—208 11 Claims

1. A ribbon cartridge retention means for holding a ribbon cartridge (1) detachably in place on a carrier (2) of a printer, typewriter or the like, said ribbon cartridge being tiltable around an axis (4) parallel to the print line and comprising a trunnion (5) on one edge and holding means on the opposite edge, said trunnion and said holding means being centered to said tilting axis, characterized in that

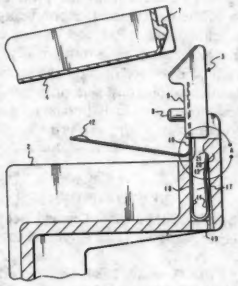
(a) said retention means is comprised of a leaf spring (3),

(b) said leaf spring includes a U-shaped base 11 having legs of unequal lengths that fits in a recess (17) provided in said carrier,

(c) said U-shaped base and said recess are arranged such that a holding arm (10) of said leaf spring stands upright from said carrier,

(d) a tenon (8) is provided on said upright standing holding arm of said leaf spring at said tilting axis,

(e) said tenon snapping in a recess (7) provided in said holding means of said cartridge when said cartridge is inserted in place on said carrier whereby said tenon first has been bent out of the way against the biasing force of said holding arm,



(f) said leaf spring further includes a leg (12) that protrudes toward said edge of said cartridge carrying said trunnion, and

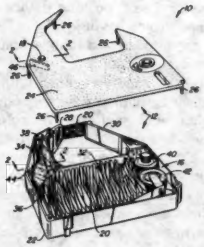
(g) said protruding leg in its unstressed state protrudes slightly away from said carrier and in its stressed state, when said cartridge is put in place on said carrier, biases said cartridge upwardly against said tenon of said holding arm and biases said cartridge so as to provide lifting force for pushing said cartridge out of its place when said tenon is removed out of said recess of said cartridge upon bending said biasing holding arm away from said cartridge.

4,624,593

IMPACT PRINTER CLEANING SYSTEM

Deborah A. Humphries, and Karla J. von Hungen, both of 1684 Market St., San Francisco, Calif. 94102

Filed May 8, 1985, Ser. No. 732,130
Int. Cl.[4] B41F *35/00;* A47L *25/00*
U.S. Cl. 400—702 1 Claim



1. In an impact printer having a print head and a platen, said impact printer being normally operated with a print cartridge mounted in said printer and containing a print ribbon arranged to pass between the print head and the platen, a method of cleaning the print head without removing the print head from the printer comprising the serial steps of:

providing a cleaning cartridge including a dry flexible absorbent cleaning ribbon;

mounting said cleaning cartridge in said impact printer in place of said print cartridge so that said cleaning ribbon passes between said print head and said platen;

manually applying a volatile solvent, in an amount selected and controlled by the user, directly to said cleaning ribbon at a single unexposed location within said cleaning cartridge to form a single, continuous, relatively short, wetted portion of said cleaning ribbon;

operating the printer to automatically advance the cleaning ribbon past said print head while causing the print head to impact against said wetted portion, thereby transferring ink and dirt residues from the print head to the wetted portion of the ribbon, said ribbon being impacted by said printer immediately after said solvent is applied; and

operating the printer to automatically advance first the entirety of said wetted portion and second a dry portion of said cleaning ribbon past said print head while causing the print head to continuously impact said ribbon first to clean and subsequently to dry the print head.

4,624,594

FLUID DISPENSER

Toshiyuki Sasaki, Tokyo, and Tomozo Sekiguchi, Kawaguchi, both of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,537

Claims priority, application Japan, Nov. 28, 1983, 58-222136; Nov. 29, 1983, 58-225199; Dec. 28, 1983, 58-249998; May 28, 1984, 59-106495; Jun. 28, 1984, 59-131986

Int. Cl.[4] B43K *5/06, 5/16*

U.S. Cl. 401—176 **11 Claims**

1. A fluid dispenser comprising:

a tubular body having an outlet nib at one end thereof, said tubular body having a liquid chamber therein for containing a liquid, said liquid chamber being connected to said outlet nib so that the liquid can be fed to said outlet nib when pressure is applied to liquid in said liquid chamber;

a pushing device longitudinally slidably mounted within said tubular body and having means in said liquid chamber for applying pressure to the liquid in said liquid chamber when said pushing device is moved toward said outlet nib;

feed means connected to said pushing device for progressively advancing said pushing device toward said outlet nib, said feed means having:

a nut fixedly mounted in said tubular body at the rear of said pushing device,

a threaded rod threadedly engaged with said nut,

a rotary means longitudinally slidably engaged with said rod and engaged with said rod for rotating said rod and spring-biased in a direction away from said outlet nib,

a slider in the form of a tube in facewise abutment against said rotary means for rotating said rotary means when moved toward said outlet nib, said slider having projections on the outer surface thereof, and

guide groove means in said dispenser in which said projections of said slider are engaged for guiding said slider; and

an actuation device connected to said feed means for moving said slider when said actuation device is actuated, whereby when said actuation device is actuated, said threaded rod is rotated for being moved forward toward said outlet nib through said nut, and said pushing device is progressively moved forward, thereby supplying liquid in said liquid chamber to said outlet nib.

4,624,595

RING TYPE BINDER

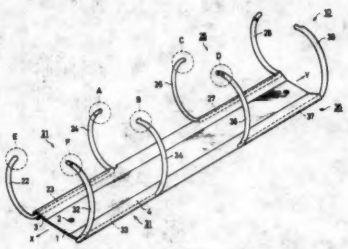
Kiyoshi Ohminato, Tokyo, Japan, assignor to King Jim Co., Ltd., Japan

Filed Jul. 10, 1984, Ser. No. 629,436

Claims priority, application Japan, Feb. 7, 1984, 59-15668[U]

Int. Cl.[4] B42F *3/04, 13/20*

U.S. Cl. 402—34 **4 Claims**



1. A ring-type binder comprising a bottom plate; a pair of fixed ring rods, each fixed ring rod comprising two fixed ring sectors jointed by a base portion and fixed to said bottom plate; and a pair of turnable ring rods, each turnable ring rod comprising two turnable ring sectors joined by a base portion and rotatably mounted on said bottom plate; said ring rods being mounted such that said fixed ring sectors and said turnable ring sectors together mate to form a pair of inner rings and a pair of outer rings, wherein only said ring sectors forming said inner rings have stopper means at the mating ends thereof for selective engagement and disengagement with each other without the use of additional opening or closing means.

4,624,596

DEVICE FOR ADJUSTING THE ANGULAR POSITION OF A DRIVING MEMBER COUPLED TO ANOTHER DRIVEN MEMBER ADAPTED TO BE ROTATINGLY DRIVEN

Jean P. Eckendorff, 29 rue Aristide Briand, 27007-Evreux, France

Filed Jan. 4, 1985, Ser. No. 689,009

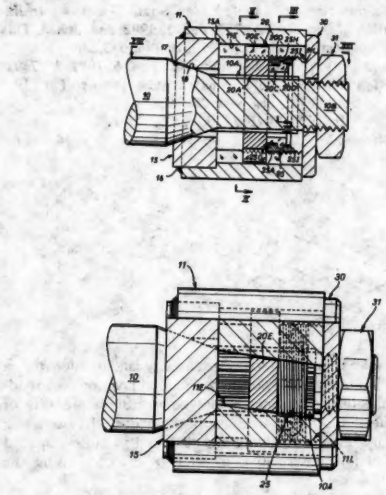
Claims priority, application France, Jan. 6, 1984, 84 00170

Int. Cl.[4] F16B *12/04, 2/14*

U.S. Cl. 403—4 **16 Claims**

1. A device for adjusting the angular position of a driving member defining a steering wheel hub and a driven member defining a steering shaft, said device comprising a ring disposed annularly between said driving member and said driven member and having inner and outer spline means cooperating with complementary means on said driving member and said driven member, a selected one of said spline means and the associated complementary means being of a helical configuration, an annular threaded member coaxial with said driving and driven members cooperable with said ring and said driving member for axially displacing said ring and thereby angularly

adjusting the position of said driving member and driven member relative to each other, and releasable means for normally



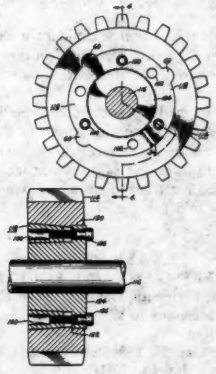
maintaining said driving member and said driven member against relative angular displacement.

4,624,597

FLANGED BUSHING MOUNTING ADAPTOR

James D. Johnson, Greer, and Terrence A. Kamp, Simpsonville, both of S.C., assignors to Reliance Electric Company, Greenville, S.C.

Filed Aug. 23, 1984, Ser. No. 643,847
Int. Cl.[4] B25G *3/00*; E21B *19/16*; F16D *1/00*
U.S. Cl. 403—16 12 Claims



1. An adaptor for use in mounting a longitudinally split, flanged bushing in the hub of a shaft-mountable element, the bushing having a tapered barrel with a large end and a small end and, at the large end, a radially extending flange with a plurality of threaded holes therein, and the hub having inner walls defining a tapered bore with a large and a small end and with recesses formed in the walls thereof, said adaptor comprising:

a. a longitudinally split annular member with a tapered body having an outer circumferential surface of a taper substantially the same as the taper of the bore of the hub, for seating in the tapered bore of the hub, and further having a central bore of a taper substantially the same as the bore of said barrel, for receiving the tapered barrel of the bushing, said tapered body having a large and a small end with the large end being larger than the small end of the bore of said hub; and

b. a plurality of threaded axial bores in the body of said annular member for receiving fastening means extending through the holes in the flange of the bushing and into said threaded bores for pressing the flanged bushing into said annular member to expand said split annular member into firm contact with the inner walls of the bore of said hub and to counteract the bushing onto the shaft on which the element is being mounted;

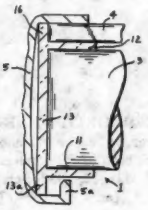
c. said central bore and said outer circumferential surface being tapered in opposite directions relative to one another.

4,624,598

TABLE LOCKING PLUGS

Edmond Gabriel, New City, and Edmund Killian, Merrick, both of N.Y., assignors to Finkel Outdoor Products, Inc., New York, N.Y.

Filed Aug. 19, 1985, Ser. No. 766,597
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—24 4 Claims



1. A table leg locking device comprising: a planar stop member, a tubular member receptive of an end of a table leg extending outwardly from one surface of the stop member with the longitudinal axis thereof perpendicular to the one surface, and two resiliently deformable ears extending outwardly from the periphery of the tubular member and on which a table top lies.

4,624,599

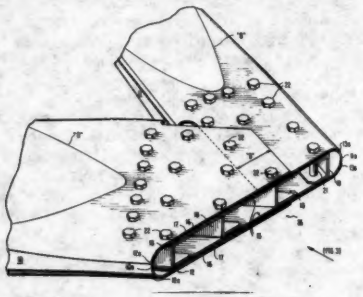
MULTI-TUBULAR TRUSS JOINT AND METHOD OF JOINING TUBE ENDS

Frank N. Piasecki, Haverford, Pa., assignor to Piasecki Aircraft Corp., Essington, Pa.

Filed Jun. 14, 1984, Ser. No. 620,700
Int. Cl.[4] F16D *3/00*; B64C *1/06*
U.S. Cl. 403—178 24 Claims

1. A structural joint comprising a plurality of partially flattened end portions of hollow cylindrical tubes, said tubes being arranged in an angular relationship with segments of each of said flattened end portions in a telescopically nesting relationship with the axes of the tubes intersecting, at the joint a segmental splice plate having an upper surface and a lower surface of which corresponding segments in different portions of said splice plate are separated by different distances, said splice plate extending interiorly of each said tube flattened end portion with said splice plate upper and lower surface segments respectively in overlapping contact with upper and lower interior surfaces of each of said plurality of tube flattened end portions, and a plurality of spaced apart, fixed fastening means in clamping contact with opposite exterior surfaces of and

penetrating transversely of each said tube flattened end portion and said contacting splice plate contained therewithin for



permanently clamping together said plurality of tube flattened end portions and said splice plate into an integral structural joint.

4,624,600

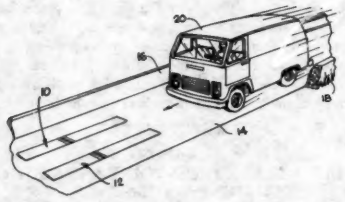
ANTI-TERRORIST VEHICLE IMPALER

Richard H. Wagner, 1679 Elm St., and George J. Wagner, 5498 Windflower Dr., both of Livermore, Calif. 94550

Filed Mar. 22, 1985, Ser. No. 715,072

Int. Cl.[4] E01F *13/00*

U.S. Cl. 404—6 **17 Claims**



1. A vehicle barrier comprising:

a pivotally mounted, counterbalanced impaler arm for burial in a section of roadbed carrying vehicular traffic, the arm having an upper surface, and having a free end, an intermediate pivot and a pivot end, the roadbed having a surface with the upper surface of the arm substantially coplanar with the roadbed surface, said pivot end having a massive counterweight opposite said free end,

means for storing gravitational potential energy associated with said counterweight below the roadbed when said arm is in said substantially coplanar position with the roadbed, said stored gravitational potential energy capable of being communicated to the free end of said impaler arm by causing said arm to rotate about the pivot, with the free end of said arm projecting upwardly from the roadbed at an angle facing said vehicular traffic, and

means for explosively releasing said potential energy on command.

4,624,601

TRANSFERABLE ROADWAY LANE DIVIDER

John P. Quittner, Castle Cove, Australia, assignor to Quick-Steel Engineering Pty Limited, New South Wales, Australia

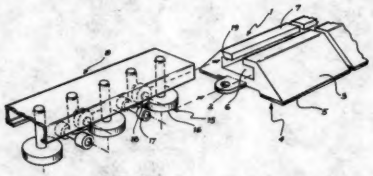
Continuation of Ser. No. 344,755, Feb. 1, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 633,236

Claims priority, application Australia, Feb. 6, 1981, PE7491

The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

Int. Cl.[4] E01F *13/00*; E01C *23/16*

U.S. Cl. 404—12 **14 Claims**



1. A method for transferring a roadway lane divider from a first position to a laterally displaced second position on a roadway or the like, said lane divider comprising a plurality of interconnected divider sections positioned in free-standing relationship on said roadway and disposed in closely spaced tandem relationship relative to each other, comprising the steps of

positioning a mobile road vehicle having a transfer mechanism adjacent to a first end of said lane divider and into engagement with divider sections thereof,

moving said transfer mechanism from the first end of said lane divider towards a second end thereof and simultaneously lifting said divider sections as a unit in suspended and spaced relationship above said roadway from said first position adjacent to a first side of said transfer mechanism,

moving said suspended divider sections as a unit serpentine-like generally transversely across said transfer mechanism from said first position towards said second position adjacent to a second side of said transfer mechanism opposite to the first side thereof, and

depositing said suspended divider sections as a unit at said second position in free-standing relationship on said roadway.

4. A transferable roadway lane divider for use with a mobile road vehicle having a transfer mechanism thereon comprising

at least one upstanding divider section having a base and an upper end, and

transfer means formed in unobstructed relationship longitudinally throughout the entire length of the upper end of said divider section for progressively receiving said transfer mechanism to enable said divider section to be lifted and suspended for transfer on a roadway in response to movement of said vehicle.

4,624,602

PARKING LOT LINE STRIPER

Joseph W. Kieffer, Plymouth, and Norman A. Cyphers, Rogers, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Oct. 26, 1984, Ser. No. 664,988

Int. Cl.[4] E01C *23/16*

U.S. Cl. 404—94 **14 Claims**

1. A device for spraying lines on a pavement comprising:

a frame member;

a paint reservoir mounted on said frame for holding an supply of paint;

means mounted on said frame for pressurizing said paint;

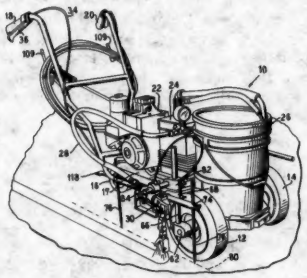
a plurality of wheels mounted on said frame to permit said frame to be rolled on said pavement;

means for mounting two of said wheels on a common axis;

a plurality of spray guns connected by conduit means to said pressurized paint;

means for removably mounting said spray guns closely adjacent at least one of said wheels and selectively positionable along the vertical plane of said common wheel axis;

means for selectively and independently manually activating said spray guns for applying paint to said pavement;



at least one of said spray guns being removably mounted to the mounting means of said wheels;

means for laterally extending one of said wheels on said common axis, and said one of said spray guns, relative to said frame;

whereby, said one of said spray guns can be moved laterally relative to said frame without changing its proximity to its associated wheel.

4,624,603

UNDERGROUND DRAIN PIPE

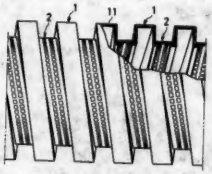
Shiro Kanao, No. 9-18, Napeidai 4-chome, Takatsukishi, Osaka, Japan

Filed Feb. 15, 1985, Ser. No. 702,103

Claims priority, application Japan, Nov. 19, 1984, 59-175455[U]

Int. Cl.⁴ E02B *11/00*

U.S. Cl. 405—49 **6 Claims**



1. An elongate underground pipe for draining off external fluids, comprising: a band-like strengthening member **(1)** having a U-shaped cross-section and flange webs **(12, 13)** extending outwardly from inward edges thereof, said strengthening member being spirally wound with a predetermined gap (L) between spaced adjacent edges of the said flange webs, with an opening of the U-shaped cross-section facing radially inwardly of the pipe, and with the flange webs defining a common cylindrical surface of revolution; and an apertured drainage band **(2)** externally wound around and bridging said gap, said band being bonded to underlying and radially outwardly facing surfaces of said flange webs, and said band defining a plurality of small holes **(21)** in a central zone thereof overlying said gap.

4,624,604

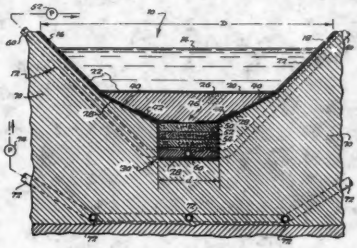
GROUNDWATER PROTECTION SYSTEM

Louis E. Wagner, Eggertsville, N.Y.; Harold F. Flannery, Batavia, Ohio, and Randolph W. Rakoczynski, Grand Island, N.Y., assignors to Environmental Design, Inc., Palm Beach, Fla.

Continuation of Ser. No. 550,781, Nov. 14, 1983, Pat. No. 4,543,013, which is a continuation-in-part of Ser. No. 324,067, Nov. 23, 1981, Pat. No. 4,430,021. This application Aug. 8, 1985, Ser. No. 763,930

Int. Cl.⁴ E02C *3/00*

U.S. Cl. 405—128 **7 Claims**



1. A ground water protection system for use with surface impoundments such as pits, ponds or lagoons and landfills, said system including a holding compartment for receiving waste material, a liquid impermeable flexible liner underlying said holding compartment for retaining liquid within said holding compartment, a drain system disposed beneath said flexible liner for collecting and removing liquid which may pass through said flexible liner, and liquid impermeable material including at least one layer of liquid impermeable clay disposed beneath said drain system for restraining passage of liquid therethrough.

4,624,605

SHIELD TUNNELING APPARATUS

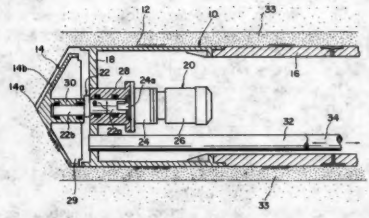
Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,342

Claims priority, application Japan, Apr. 14, 1983, 58-64609

Int. Cl.⁴ E21D *9/06;* E02F *5/10*

U.S. Cl. 405—144 **3 Claims**



1. An apparatus for tunneling a shield having an outer diameter, comprising: an eccentric collar supported rotatably by a partition wall extending across the interior of a shield body, said eccentric collar being connected to a first drive mechanism for rotating said collar; a crank shaft connected to a second drive mechanism for rotating said crank shaft and a conical or frustoconical rotary head disposed ahead of said shield and supported by an opposite end portion of said crank shaft; said first and second drive means, eccentric collar and crank shaft cooperating to rotate said rotary head in an eccen-

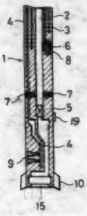
tric motion to compact ground ahead of the shield to form an annular space substantially equal to said outer diameter.

4,624,606

FOUNDATION IMPROVEMENT PROCESS AND APPARATUS THEREOF

Wataru Nakanishi, and Tadashi Morimoto, both of Machida, Japan, assignors to N.I.T. Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,835
Claims priority, application Japan, Mar. 12, 1985, 60-47576
Int. Cl.[4] E02D *3/12, 5/44*
U.S. Cl. 405—269 **2 Claims**



1. A foundation improvement process comprising:

preparing an injection rod attached at its tip with digging bits and having a first flow passage communicating with an opening portion formed at the tip of said rod through a valve;

providing a first nozzle at this side of said valve communicating with said first flow passage;

providing a second nozzle opened up encircling said first nozzle and communicating with a flow passage different from that of said first nozzle;

providing a third nozzle at a lower location than said first nozzle;

providing a diffusion nozzle at an intermediate position between said first nozzle and said third nozzle;

jetting a lubrication liquid from said opening portion at the tip of said injection rod and air from said second nozzle, while rotatingly descending said injection rod into an objective foundation;

digging a foundation by said digging bits attached to the tip of said injection rod, while discharging soil digged by said digging bits on the earth by means of the air lift effect of the air jetted from said second nozzle;

lifting said injection rod at a time when the digging degree reaches a predetermined depth, while performing jet-stream digging with respect to the side of the foundation by jetting a digging jet-stream under a high pressure from said first nozzle, and at the same time, stretching a jet-liquid curtain by jetting a high pressure diffusion jet-stream from said diffusion nozzle, and

jetting a hardening agent from said third nozzle to fill in the digging portion.

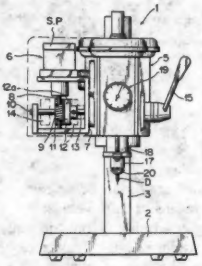
4,624,607

COMPUTED NUMERICAL CONTROL DRILLING MACHINE

Kenji Kato, and Masao Hosaka, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 370,122, Apr. 20, 1982, abandoned.
This application Dec. 17, 1984, Ser. No. 682,266
Claims priority, application Japan, May 6, 1981, 56-67839
Int. Cl.[4] B23B *35/00*
U.S. Cl. 408—1 R **2 Claims**

1. A method of computed numerical control of a drilling machine having a quill adapted for mounting a drill bit of a diameter in the order of 0.1 mm on a free end thereof and being movable toward and away from a work piece to be drilled, said quill being driven by a step motor which is operable at two pulse rates, one being a slower pulse rate for drilling and the other being a faster pulse rate for advancing to the work piece, said control method comprising a preparation step of advancing the quill with the drill bit at the faster pulse rate from an initial position to a predetermined reference position at a distance $K=l+r$ above the surface w of the work piece where l is a predetermined first drilling depth and r is a safety clearance; and a cycle of sequential working steps N of advancing, in the first working step $N=1$, the quill with the drill bit at the slower rate to advance the drill bit said predetermined first drilling depth l from the reference position to the work piece; retreating the quill with the drill bit at the faster pulse rate to retrieve the drill bit to the reference position after the drill bit has advanced the first drilling depth l; advancing the quill with the drill bit at the faster pulse rate until the drill bit is advanced a predetermined portion $(l-r)$ of the first drilling depth from



the reference position, where the drill bit is spaced apart about a clearance 2r from the surface w; further advancing, in the second working step $N=2$, the quill with the drill bit at the slower pulse rate to a second drilling depth $(l-2r)+l$; then retreating the quill with the drill bit at the faster rate to retrieve the drill bit to the reference position after the drill has advanced the second drilling depth; said cycle of sequential working steps N being repeated with corresponding fast advances over successive drilling depths $N(l-r)$ until a hole of a final depth determined by the relationship $(N-1)(l-r)+l$ is formed in the work piece; finally retreating the quill at the faster pulse rate to retrieve the drill to the initial position after the drill bit has advanced to the final drilling depth; and said cycle of sequential working steps being performed under the control of a program stored in a computer wherein the number of N of working steps, the clearance r, the first drilling depth l and the two pulse rates are input variables.

4,624,608

PILOT PIN-LOCKING DEVICE IN DRILLING MACHINES

Iwaji Shiomi, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Japan

Continuation of Ser. No. 486,637, Apr. 20, 1983, abandoned.
This application Jul. 1, 1985, Ser. No. 750,465
Claims priority, application Japan, Apr. 21, 1982, 57-56846
Int. Cl.[4] B23B *51/04*
U.S. Cl. 408—56 **4 Claims**

1. A drilling machine comprising:

a hollow shaft, mounted for reciprocal vertical and rotational travel between a lower working position and an upper resting position;

an annular cutter mounted to said hollow shaft for rotational and vertical movement in unison with said hollow shaft;

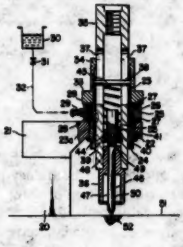
a pilot pin axially mounted within said annular cutter for independent vertical reciprocal movement from an upper unrestrained position to a lower locked position, relative to said hollow shaft and said annular cutter, said pilot pin having a head portion and a shank portion, said shank

portion having a groove extending from a lower portion to an upper portion spaced from said head portion, thereby forming an upper shank portion without a groove;

an engaging member separate from said pilot pin and disposed within said hollow shaft, said engaging member being biasable against said head portion of said pilot pin by a first spring means having one end fixed in place, said engaging member thereby following the reciprocal vertical movement of said pilot pin from an upper unrestrained position to a lower locked position, said engaging member being biased against said head portion of said pilot pin only during said reciprocal vertical movement of said pilot pin or when said pilot pin is in said upper unrestrained position;

an internal oil reservoir within said hollow shaft adapted to be automatically supplied with oil by an external oil supply means;

said oil flowing from said internal oil reservoir past said engaging member and down said pilot pin when said



engaging member and said pilot pin are in an upper position, and said hollow shaft and annular cutter are in said lower working position;

said engaging member being seated on a ring and substantially blocking the flow of oil down said pilot pin when said engaging member is in its lower position, said engaging member including a horizontal cavity alignable with an annular depression in the inner wall of said hollow shaft when said engaging member is in its lower position;

a ball received in said horizontal cavity and biased outwardly by a second spring means, said ball being extendible by said second spring means to a position within said annular depression when said horizontal cavity is aligned therewith, said position maintaining said ball partially within each of said cavity and said annular depression, thereby releasably locking said engaging member to said hollow shaft to maintain said pilot pin in said lower locked position while centering said drilling machine and to substantially block the flow of oil down said pilot pin when in said lower locked position.

4,624,609

APPARATUS FOR MILLING SIGN CUTOUTS AND LETTERS FROM TEMPLATES

David R. Pickett, 1613 S. 24th, Blue Springs, Mo. 64015

Filed Mar. 5, 1985, Ser. No. 708,238

Int. Cl.[4] B23C *1/16*

U.S. Cl. 409—96 **10 Claims**

1. Apparatus for milling sign cutouts and letters from templates comprising:

a frame;

a housing shiftably carried by the frame for movement in any direction along paths of travel which lie in a common plane;

an elongated, workpiece-engageable cutting bit rotatably carried by said housing;

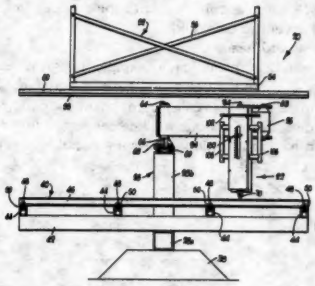
means for rotating said bit;

an elongated guide coupled to said housing and adapted to engage the edge surfaces of a template,

said guide and the bit being disposed to project outwardly from said housing in generally opposite directions in perpendicular relationship to the plane in which said housing is movable;

a workpiece support located in a position to carry a workpiece in parallel relationship to said plane in which the housing is movable and in disposition for selective engagement of the bit with the workpiece;

a template support in a position to carry a template in generally parallel relationship to said plane and located such that the guide may be disposed to ride along said edge surfaces of the template; and



a mirror between said supports, movable with the housing and having a reflective surface facing toward a template on the template support when the latter is in said position thereof,

said mirror being located in disposition such that during use of the bit to produce a reproduction of the template in the workpiece, the operator may visually observe the reflected image of the guide in engagement with the edge surfaces of the template and also see the bit in contact with the workpiece without significant movement of the operator's head being required.

4,624,610

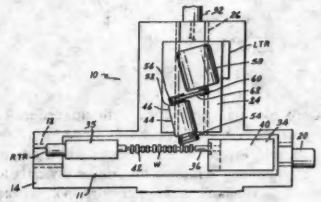
MILLING MACHINE

James D. Phillips, Posen, and Robert L. Sheets, Madison Heights, both of Mich., assignors to J. D. Phillips Corporation, Alpena, Mich.

Division of Ser. No. 508,084, Jun. 27, 1983, Pat. No. 4,551,048. This application Sep. 3, 1985, Ser. No. 771,827

Int. Cl.[4] B23C *3/06*

U.S. Cl. 409—132 **9 Claims**



1. A method of milling an eccentric cam on a cam shaft, comprising:

supporting and rotating the cam shaft about its longitudinal axis,

providing a milling cutter comprising a rotatable milling head, said head having a front face adjacent to the cam shaft, and a plurality of cutting elements having cutter

edges and mounted on an annular portion of said front face of said head in a circular array about the axis of rotation of said head,

supporting said head with its front face in confronting relation to the cam shaft and with its axis of rotation at an acute angle to the longitudinal axis of the cam shaft such that when said head is rotated the path of said cutting edges lies in a plane which forms an acute angle with the longitudinal axis of the cam shaft and such that the cutting elements successively engage the cam on the cam shaft,

feeding said milling head toward and away from the cam shaft in a path at right angles to the longitudinal axis of the cam shaft in accordance with the contour to be milled on the eccentric cam, and

rotating said head,

said cutting elements each taking a progressive cut beginning at a point on said side edge of said cam which has a substantial force vector component longitudinally of the cam shaft and ending in a line across the full width of the cam having a force vector substantially perpendicular to the cam shaft.

4,624,611

HOUSING STRUCTURE FOR AUTOMATIC BAR LOADERS/FEEDERS

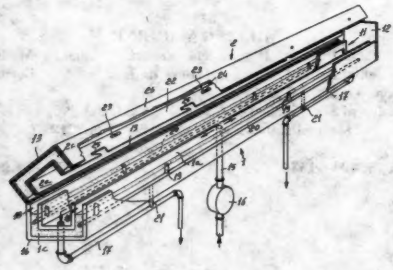
Vladimiro Fabbri, Faenza, Italy, assignor to I.E.M.C.A. S.p.A. Industria Elettromeccanica Complessi Automatici, Faenza, Italy

Filed May 21, 1984, Ser. No. 612,493

Claims priority, application Italy, Jun. 9, 1983, 3457 A/83

Int. Cl.[4] B23B *13/08*

U.S. Cl. 414—14 **8 Claims**



1. A box-like main body for automatic feeders, comprising a lower portion, a bed an openable upper portion and a bar magazine, said lower portion being carried on said bed, said bar magazine being arranged longitudinally next to said body, said lower portion and said upper portion comprising an inner half-jacket, an outer half-case, a cavity, a longitudinal bar guide, and a blanket, said blanket being composed of sound deadening and cushioning material, intervening between and interconnecting said inner half-jacket and said outer half case, said cavity being sealingly defined between said lower portion and said upper portion and enclosing said longitudinal bar guide, said box-like main body further comprising a filling and oil lubricating system, said cavity being connectable to said filling and oil lubricating system.

4,624,612

GUIDE-BAR DEVICE FOR MULTI-SPINDLE LATHE

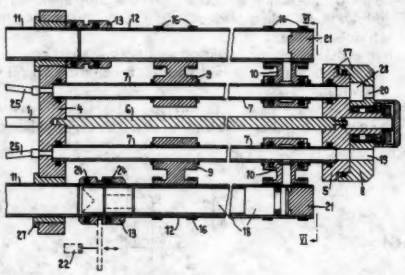
Markus Geiser, Péry, and Claude Vandevoir, La Neuveville, both of Switzerland, assignors to Sameca, S.A., Lamboing, Switzerland

Filed Mar. 28, 1984, Ser. No. 594,286

Claims priority, application European Pat. Off., Apr. 8, 1983, 83810142.6

Int. Cl.[4] B65H *7/00*

U.S. Cl. 414—18 **10 Claims**



1. A guide bar device for a multi-spindle lathe having a rotatable barrel operable to be indexed by said multi-spindle lathe, said rotatable barrel comprising:

at least one generally centrally disposed shaft;

at least one intermediate disk disposed on said shaft;

a plurality of guiding tubes removably supported by and radially spaced from said shaft by means of said intermediate disk, each of said guiding tubes having an inlet for introducing a bar stock to be machined therein;

means, associated with each of said guiding tubes, for rotatingly supporting and advancing bar stock in said guiding tubes;

said guide bar device further comprising:

a plurality of extension tubes, each positioned opposite the inlet of a respective one of the said guiding tubes for receiving said means for rotatingly supporting and advancing;

means for removably coupling and aligning said extension tubes with said guiding tubes; and

means for laterally displacing an extension tube with its associated means for rotatingly supporting and advancing with respect to said respective guiding tube to thereby open the inlet of said respective guiding tube

whereby bar stock to be machined may be inserted through the open inlet of said guiding tube.

4,624,613

SELF-SERVICE APPARATUS FOR SERVING FOODS OR DRINKS

Harusige Taniguchi, Tokyo, and Kyoko Taniguchi, 4-432, Ikebukuro, Toshima-ku, Tokyo, both of Japan, assignors to Kyoko Taniguchi, Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,210

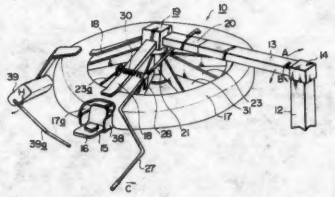
Claims priority, application Japan, Jul. 28, 1984, 59-157983

Int. Cl.[4] A47G *21/00*; E04H *3/04*; B25J *15/00*; B25B *1/00*

U.S. Cl. 414—9 **12 Claims**

1. A self-service apparatus for selectively serving foods or drinks to those physically handicapped to be confined in bed, which comprises support means, a cover fixedly suspended from said support means to cover foods and drinks, a shaft connected to and extending from said support means, a rotary disk mounted on said shaft for rotating about said shaft, operable means for rotating said rotary disk, a plurality of server means arranged at the periphery of said rotary disk for carrying thereon said foods and drinks, said operable means being

actuated by a user to rotate said rotary disk and said server means until said rotary disk is stopped at a desired position to serve a selected food or drink, means for holding said foods or drinks stationary during said rotation of said disk, and releasing means for releasing said foods or drinks when said rotary disk



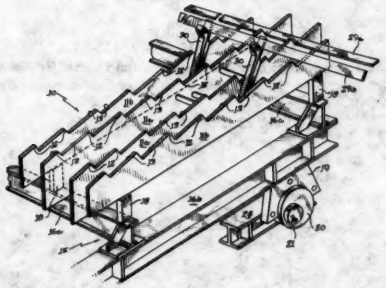
is stopped at said desired position, said holding means including two ccnfronting pinching means movable towards each other by the operation of said releasing means to hold the food and drinks and also movable away from each other by the operation of said releasing means to release said foods or drinks at said desired position.

4,624,614

METHOD AND APPARATUS FOR PACK COOLING FLAT STOCK

Thomas M. Levad, Wilton, and Lisle A. Jewell, Davenport, both of Iowa, assignors to Cargill, Inc., Minnetonka, Minn.

Filed Apr. 1, 1985, Ser. No. 718,516
Int. Cl.[4] B21B *43/10*
U.S. Cl. 414—95 **5 Claims**



1. A method of pack cooling a plurality of steel bars or the like on a cooling bed having stationary notch bars and movable notch bars to transport the steel bars from one end of the cooling bed to the other, comprising the repetitive steps of:

placing a first steel bar on the notch bars of the cooling bed so that it will be transported by the movable notch bars to a stacking notch in the stationary notch bar;

transporting the first steel bar to the stacking notch in the stationary notch bars;

collecting the first steel bar from the stacking notch;

placing a second steel bar in the stacking notch of the stationary notch bar; and

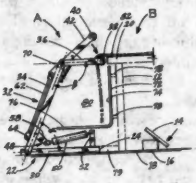
returning the first steel bar on top of the second steel bar to form a stack.

4,624,615

STACKER FOR PANTS AND OTHER SEWN GARMENTS

Jackie D. Russell, Linn County, and Kent M. Linneman, Chariton County, both of Mo., assignors to The Biltwell Company, Inc., St. Louis, Mo.

Filed Mar. 26, 1984, Ser. No. 594,001
Int. Cl.[4] D05B *33/00*
U.S. Cl. 414—97 **2 Claims**



1. For use with sewing apparatus or the like, a stacker for the seizing and stacking of sewn articles in succession comprising a main support structure, a stacking bar, a frame pivotally connected to the main support structure and carrying the stacking bar horizontally for movement between an article-receiving position extending laterally along and closely proximate the sewing apparatus for receiving a sewn article therefrom and a retracted position spaced outwardly from the sewing apparatus, a clamping bar, means carrying the clamping bar parallel to the stacking bar and pivotally connected to the frame for movement of the clamping bar between an open position spaced from the stacking bar and a clamping position confronting the stacking bar for gripping a sewn article therebetween, and a single driving means comprising an extensible-retractible cylinder having one end connected to the main support structure and a linkage comprising a bell crank carried by the frame and having a first point of connection to an actuating rod of the cylinder, and a pushrod connected to a second point of connection of the bell crank, the pushrod extending along the frame and interconnected with the clamping bar carrying means, said linkage interconnecting the other end of the cylinder with said frame and the clamping bar carrying means for causing

(a) movement of the clamping bar to its clamping position,

(b) subsequent movement of the stacking bar to its retracted position, thereby to seize the received sewn article, pull it from the sewing apparatus, and stack it on the stacking bar, and

(c) ultimate return movement of the stacking bar to its receiving position together with movement of the clamping bar to its open position, whereby the stacking bar may receive another sewn article overlying the first article.

4,624,616

PALLET DISPENSER

Milan W. Freese, 925 18th St. SW., Cedar Rapids, Iowa 52404

Continuation-in-part of Ser. No. 582,990, Feb. 24, 1984, abandoned. This application Oct. 24, 1985, Ser. No. 791,034
Int. Cl.[4] B65G *59/06*
U.S. Cl. 414—129 **5 Claims**

1. Apparatus for storing and selectively dispensing pallets upon demand of a pallet truck operator, the invention comprising:

a vertically disposed housing capable of containing a stack of generally aligned, horizontally positioned pallets,

said housing having opposing sidewalls with an opening therebetween for receiving said stack of pallets and for discharging said pallets,

said sidewalls having outwardly angled extensions adjacent to the opening,

said extensions being sufficiently non-deflectable to force misaligned pallets in a stack of pallets into general alignment,

each of said sidewalls having an axle transversely fixed to the exterior thereof along the vertical length of the sidewall,

each of said sidewalls having openings therein adjacent said axle,

each of said sidewalls having a plurality of wheels disposed vertically in said openings of said sidewalls and being fixed upon said axle,

each of said wheels extending a substantially equal diametric distance into the interior of said housing,

each of said plurality of wheels having a resilient surface on the circumference thereof,

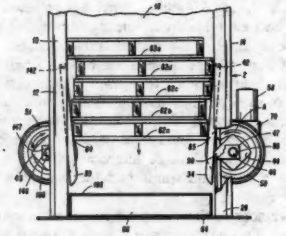
said pluralities of wheels on said sidewalls being oppositely arranged,

the resilient surfaces of opposing wheels being spaced apart a distance less than the width of a pallet,

said resilient surfaces being deflectable by a pallet being forcibly passed between said wheels in said sidewalls when said wheels are rotated,

each of said plurality of wheels comprising a pair of wheels and a third wheel spaced apart from said pair of wheels,

a plurality of planar, generally square cams mounted upon each of said axles and fixed thereto in substantially identical orientation,



each of said sidewalls having a pair of generally narrow cam receiving vertical openings therein,

said narrow vertical openings being generally aligned with the planes of said cams,

a pivoting bar member pivotally movable within each of said narrow vertical openings,

said cams selectively engaging said pivoting bar members as said axles are rotated,

said bar members being biased to return to substantially vertical alignment when not engaged by said cams,

said pivoting bar members being urged inwardly into said housing upon the engagement of said cams with said bar members,

said bar members engaging the sides of a pallet positioned above the wheels to center said pallet within said housing,

a motor for incrementally driving said axles simultaneously in opposing rotations,

said wheels rotating with said axles such that the resilient surfaces thereof rotate downwardly within said housing,

a switch to selectively energize said motor,

said switch means being accessible to the operator of a pallet truck without departure from said pallet truck.

4,624,617

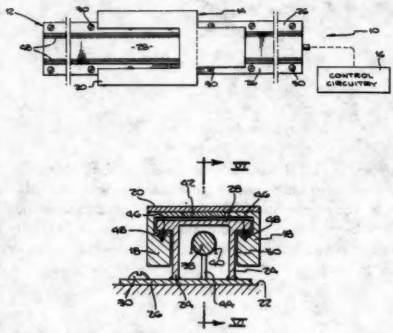
LINEAR INDUCTION SEMICONDUCTOR WAFER TRANSPORTATION APPARATUS

David Beina, 251 Sierks St., Costa Mesa, Calif. 92627

Filed Oct. 9, 1984, Ser. No. 659,185

Int. Cl.[4] B60L *13/10*

U.S. Cl. 414—347 10 Claims



1. A linear induction transportation mechanism for semiconductor wafers, comprising:

car means for supporting a semiconductor wafer, said car means including a body portion and a wafer support portion attached to said body portion and adapted to engage the body portion of an adjacent car means to allow said semiconductor wafer to be transferred to said adjacent car means;

track means for guiding said car means;

linear induction motor means for levitating and linearly propelling said car means along said track means; and

control means for precisely controlling the amount of said levitating and for regulating the lateral movement of said car means relative to said track means.

4,624,618

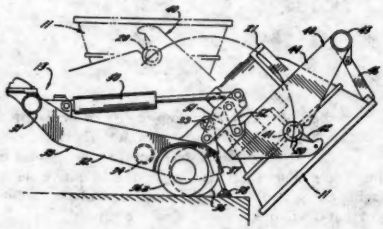
REACH BACK SLAG POT CARRIER

William L. LaBerdia; Edward S. Kress, and Dennis R. Thomas, all of Brimfield, Ill., assignors to Kress Corporation, Brimfield, Ill.

Filed Feb. 22, 1985, Ser. No. 704,614

Int. Cl.[4] B65G *65/23*

U.S. Cl. 414—420 6 Claims



1. A carrier for lifting, transporting and dumping a pot or the like having lateral trunnions, comprising in combination, a self-propelled tractor and a wheeled trailer having a longitudinal center line and a generally U-shaped frame with rearwardly projecitng side members and a forwardly projecting integral gooseneck pivotally connected to the tractor to permit turning thereof at substantially right angles, a cradle pivotally

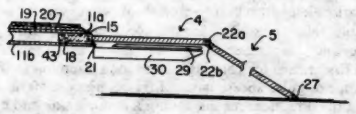
mounted adjacent the rear ends of the side members and adapted to engage the trunnions and embrace the pot, a rear cross frame secured between said side members and having rigidly attached rearwardly projecting mounting members thereon, means for journalling a plurality of trailer wheels on transverse axes adjacent the ends of said side members and mounting members for supporting said trailer, cradle and pot, at least one of said wheels on each side of said trailer center line having its axis set forward of the axes of said other wheels by less than the diameter of the wheel, means including a rear hydraulic actuator secured to at least one of said side members and mounting members behind each of said one wheels which is forwardly offset and the hydraulic actuator being substantially within the overall length and width of said trailer as defined by the outer perimeter of said wheels, said hydraulic actuator having an outrigger foot for engaging the ground when said pot is lifted and dumped by said cradle, and means including a primary hydraulic actuator for swinging said cradle about said pivotal mounting on said side members to lift said pot, through said trunnions, from a position behind said trailer wheels and for swinging said pot into a transport position on said trailer ahead of said wheels.

4,624,619

RETRACTABLE RAMP ASSEMBLY FOR PICK-UP TRUCK

Michael L. Uher, P.O. Box 770537, Eagle River, Ak. 99577

Filed Sep. 4, 1984, Ser. No. 646,768
Int. Cl.[4] B65G *67/02*
U.S. Cl. 414—537 **1 Claim**



1. In a vehicle of the type having a generally horizontal bed supported by wheels; said bed having a rear end; a tailgate hinged to said rear end of said bed, for angular movement from a closed to an open position; said tailgate having an inner wall and also having a free end which constitutes a rear end when the tailgate is open; and means which limits the angular movement of said tailgate, as it is opened, to a position in which said inner wall lies horizontal and in the same plane as said bed and as a continuation of said bed;

relatively flat elongated ramp means movable from a first position on said bed to a second position in which at least a portion of said elongated ramp means extends beyond said tailgate while said tailgate is open, said elongated means when in said first position being sufficiently small that it is located wholly within the vehicle when the tailgate is closed;

said elongated ramp means having a first section having a rear end which is at least as far rearwardly as said rear end of said tailgate, when the elongated means is in said second position, said first section being positioned flush with said inner wall of said tailgate when said elongated means is in said second position,

said elongated ramp means also having a ramp section having front and rear ends,

said elongated ramp means also including hinge means connecting the rear end of said first section to the front end of said ramp section, so that when the elongated means is in said second position the ramp section is movable to a position wherein the rear end of said ramp section is at a different level than the front end of said ramp section whereby to form a ramp,

whereby said elongated means may be stored above the bed of said vehicle when the tailgate is closed, and whereby when the tailgate is open the elongated means may be moved to said second position in which said ramp section constitutes a ramp,

said elongated means including means in which the rear section of the ramp may be swung downward to provide a ramp from the ground to the vehicle, or may be swung upwardly to provide a ramp extending downwardly from an elevated dock to the vehicle, and limit means to limit upward movement of said first section when said elongated ramp means is in said second position,

said limit means comprising: a side rail along one side of said elongated ramp means having a flange above said elongated ramp means, and a second side rail along the other side of said elongated ramp means having a flange above said elongated ramp means, whereby to provide a guide for said elongated ramp means and to limit upward and downward movement thereof, and

an element which locks said elongated means to (a) restrain both forward and rearward motion of said elongated means when it is in said second position, and (b) to insure that at least one of said flanges on at least one of said side rails limits the upward travel of said first section of said elongated ramp means,

said element comprising pin locking means that passes through said elongated means and one of said side rails, and

stop means for limiting the rearward travel of said elongated ramp means to thereby insure that at least one of the flanges on at least one of said side rails limits the upward travel of said first section of said elongated ramp means,

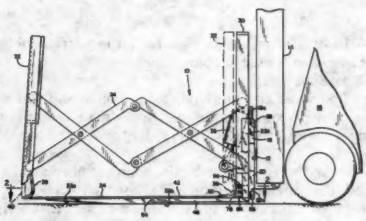
said pin locking means also holding said elongated means in said first position after it has been moved to said first position.

4,624,620

FORKLIFT TRUCK PUSH-PULL SLIPSHEET HANDLER FOR FACILITATING CONVERSION OF TRUCK BETWEEN SLIPSHEET HANDLING AND PALLET HANDLING CAPABILITIES

Stanley E. Farmer, Corbett, Oreg., and Richard D. Seaberg, Vancouver, Wash., assignors to Cascade Corporation, Portland, Oreg.

Division of Ser. No. 634,694, Jul. 26, 1984, abandoned, which is a division of Ser. No. 493,141, May 9, 1983, Pat. No. 4,482,286.
This application Jun. 6, 1985, Ser. No. 741,727
The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.
Int. Cl.[4] B66F *9/14*
U.S. Cl. 414—607 **9 Claims**



1. A push-pull slipsheet handler adaped for rapid mounting and demounting with respect to a pair of transversely-spaced load-lifting forks having upwardly-facing load-supporting surfaces thereon, said forks being mounted on a vertically-movable lift truck carriage, said push-pull slipsheet handler comprising:

(a) a push-pull assembly including an upright frame, a push plate, power means mounted on said frame for selectively extending and retracting said push plate with respect

respect to said frame and selectively openable and closable jaw means on said push plate for gripping a slipsheet;

(b) platen means overlying said forks for supporting a slipsheet thereon, said platen means having a downwardly-facing surface engaging said upwardly-facing load-supporting surfaces of said forks so as to be vertically supported by said upwardly-facing load-supporting surfaces, said forks being supported vertically by said carriage;

(c) means for connectine said frame of said push-pull assembly to said platen means for mounting and demounting of said frame and platen means as a unit with respect to said forks and carriage;

(d) said frame of said push-pull assembly having a top and a bottom and said forks having upstanding portions extending above the bottom of said frame, said frame being positioned in substantially coextensive and parallel overlapping relationship in a rearward direction with respect to said upstanding portions of said forks and said platen means having a transverse rear edge located forwardly of said upstanding portions of said forks when said frame and platen means are mounted with respect to said forks and carriage; and

(e) means supportably suspended from said platen means and interconnected between said downwardly-facing surface of said platen means and said frame of said push-pull assembly for vertically supporting at least the majority of the weight of said frame by applying said weight of said frame to said platen means by suspension from below said downwardly-facing surface.

4,624,621

WRIST MECHANISM FOR INDUSTRIAL ROBOTS AND THE LIKE

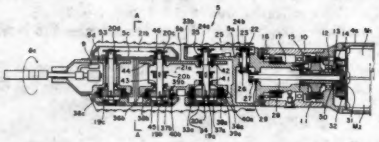
Tsudoi Murakami, and Yasuhide Nagahama, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 6, 1983, Ser. No. 511,236

Claims priority, application Japan, Oct. 21, 1982, 57-185824; Feb. 4, 1983, 58-15814[U]; Feb. 8, 1983, 58-17187[U]; Apr. 5, 1983, 58-60420

Int. Cl.[4] B25J *9/06*

U.S. Cl. 414—735 **24 Claims**



1. A flexible wrist mechanism for an industrial robot, said flexible wrist mechanism comprising:

(a) a base member;

(b) a first wrist element having a proximal and and a distal end, the proximal end of said first wrist element comprising a hollow rotational drive shaft journaled in said base member;

(c) a second wrist element having a proximal end and a distal end, the proximal end of said second wrist element being disposed adjacent to the distal end of said first wrist element;

(d) a first motor for driving a first motor shaft for imparting rotational movement to the wrist mechanism;

(e) a second motor for driving a second motor shaft for imparting a flexing movement to the wrist mechanism;

(f) a transmission shaft coaxially disposed within said hollow rotational drive shaft, said transmission shaft being journaled in said hollow rotational drive shaft, said transmission shaft being operatively connected to said second motor shaft;

(g) a first reducer means having a driving side and a driven side, the driving side of said first reducer means being operatively connected to said first motor shaft and the driven side of said first reducer means being operatively connected to said hollow rotational drive shaft such that rotation of said first motor shaft by said first motor causes rotation of said hollow rotational drive shaft and said first wrist element at a reduced speed;

(h) a first coupling shaft journaled in the distal end of said first wrist element and in the proximal end of said second wrist element, whereby said second wrist element is swingable relative to said first wrist element through said first coupling shaft;

(i) an intermediate shaft journaled in said first wrist element intermediate its proximal and distal ends, said intermediate shaft being operatively connected to said transmission shaft and to said first coupling shaft such that rotation of said transmission shaft by said second motor shaft causes said intermediate shaft to rotate and the rotation of said intermediate shaft causes said first coupling shaft to rotate;

(j) a second reducer means having a driving side and a driven side, the driving side of said second reducer means being operatively connected to said first coupling shaft and the driven side of said second reducer means being operatively connected to said second wrist element such that rotation of said first coupling shaft by said intermediate shaft causes said second wrist element to pivot at a slower angular speed than said intermediate shaft rotates;

(k) a third wrist element having a proximal end and a distal end, the proximal end of said third wrist element being disposed adjacent to the distal end of said second wrist element;

(l) a second coupling shaft journaled in the distal end of said second wrist element and the proximal end of said third wrist element, whereby said third wrist element is swingable relative to said second wrist element through said second coupling shaft;

(m) first means for rotating said second coupling shaft at the same angular speed as said first coupling shaft; and

(n) a third reducer means having a driving side and a driven side, the driving side of said third reducer means being operatively connected to said second coupling shaft and the driven side of said third reducer means being operatively connected to said third wrist element such the rotation of said second coupling shaft by said first means causes said third wrist element to pivot at the same angular speed as said second wrist element.

4,624,622

FAIL-SAFE SYSTEM FOR A REVERSIBLE PUMP-TURBINE APPARATUS

Takao Kuwabara, and Keitaro Takiguchi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 554,075

Claims priority, application Japan, Nov. 20, 1982, 57-204406

Int. Cl.[4] F01D *17/00, 21/14;* **F15B** *9/02*

U.S. Cl. 415—14 **6 Claims**

1. A fail-safe system for use in a pump-turbine apparatus of the type having a runner adapted to operate in pump operation mode and turbine operation mode, a working chamber surrounding said runner, a series of guide vanes for controlling a water flow coming into said chamber, a servo-motor adapted to drive said guide vanes to change an opening degree thereof, and means for selectively supplying said servo-motor with pressurized liquid, said fail-safe system comprising:

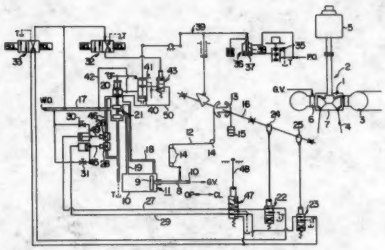
means for setting different rates of change of opening degree of said guide vanes for respective operation modes;

means for determining, in accordance with the opening degree of said guide vanes, timing at which the rate of change of tne opening degree of said guide vanes is changed; and

means for transmitting an information representing the opening degree of said guide vanes to said determining means;

wherein the improvement comprises:

means for detecting a trouble in said transmitting means and to generate a signal in accordance with said trouble; and



means for setting rates of change of the opening degree of said guide vanes for respective operation modes in accordance with said signal from said detecting means.

4,624,623

WIND-DRIVEN GENERATING PLANT COMPRISING AT LEAST ONE BLADE ROTATING ABOUT A ROTATION AXIS

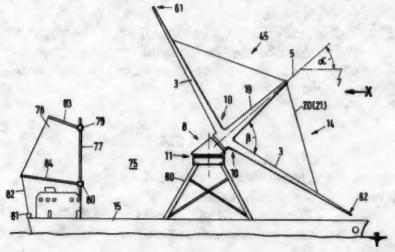
Gunter Wagner, Suderheide 1, D-2282 List, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 514,804, Jun. 22, 1983, abandoned. This application Mar. 20, 1985, Ser. No. 714,614

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1981, 3142434; Apr. 10, 1982, 3213396; PCT Int'l Appl., Sep. 17, 1982, PCT/DE82/00186

Int. Cl.⁴ F03D *1/00, 9/00, 11/04*

U.S. Cl. 416—19 **13 Claims**



1. A wind-driven generating plant comprising:

a support means;

a rotor assembly having a pair of members, at least one of which is a blade having an airfoil cross-section, said rotor assembly having a rotor assembly rotational axis about which said assembly rotates, each of said members lying at an angle in a range of approximately 40°–80° to the rotor assembly rotational axis;

a rotor hub mounted on said support means for rotation about a vertical axis, said hub receiving said rotor assembly for rotation about said rotor assembly rotational axis and for orienting said axis at an angle in a range of 30°–70° to the horizontal, said hub having energy transmission means coupled to said rotor assembly;

a pylon mounted on said rotor assembly and extending along said rotor assembly rotational axis; and

guy members extending between said rotor assembly members and pylon, said guy members being fixed to the blade eccentrically with respect to the blade center of gravity for altering the angle of incidence of said blade.

4,624,624

COLLAPSIBLE VERTICAL WIND MILL

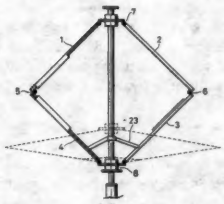
Nak I. Yum, 1035, Aza Kakazu, Ginowan-City, Okinawa-Pref., Japan

Filed Mar. 25, 1985, Ser. No. 715,462

Claims priority, application Japan, Mar. 26, 1984, 59-56367; Mar. 19, 1985, 60-53426

Int. Cl.⁴ F03D *3/06*

U.S. Cl. 416—87 **18 Claims**



1. A collapsible vertical wind mill comprising:

a vertically extending center shaft;

four linear main wings, hinge means interconnecting the wings in a rhombic form capable of corner angle varition with opposed upper and lower corners penetrated by said center shaft, and with hinged outer corners between the upper and lower corners, said lower corner of said rhomb being formed by an attachment located at a fixed position with respect to said vertical center shaft, said upper corner of said rhomb being constituted by a slidable ring slidable along said vertical center shaft;

a ring stopper provided on said vertical center shaft at a lower position thereof for providing a lower limit position of said slidable ring; and

auxiliary wings each provided on each of said main wings.

4,624,625

HIGH PRESSURE METERING PUMP

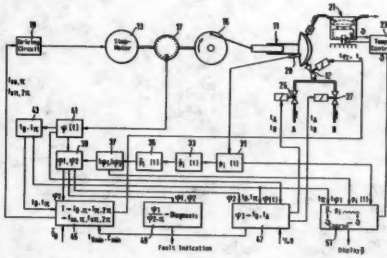
Helge Schrenker, Karlsruhe, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 426,047, Sep. 28, 1982, abandoned. This application Mar. 14, 1985, Ser. No. 712,332

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3139925

Int. Cl.⁴ F04B *49/06*

U.S. Cl. 417—20 **11 Claims**



1. A pump for pumping a compressible liquid at a mean aspiration flow rate, the pump having a reciprocal pumping cycle including an aspiration portion, a compression portion, a feed portion and a decompression portion, the pump comprising:

a chamber for containing the liquid, said chamber having a stroke volume;

a piston, slidably engaged within the chamber, for exerting an internal pressure on the liquid;

driving means, coupled to the piston, for causing the piston to move reciprocally within the chamber at a stroke frequency;

encoder means, coupled to the piston, for measuring the instantaneous angular position of the piston and for generating an angle signal indicative of said position;

pressure detector means, coupled to the chamber, for measuring the instantaneous internal pressure of the chamber and for generating a pressure signal indicative thereof;

logic means, coupled to the encoder means and to the pressure detector means, for receiving the angle and pressure signals and for determining an aspiration angle, ϕ_2, at which a transition between the decompression and aspiration portions occurs; and

control means, coupled to the logic means and to the driving means, for receiving the aspiration phase angle and, responsive thereto, for causing the driving means to vary the stroke frequency such that the mean aspiration flow rate is maintained substantially equal to a desired rate.

4,624,626

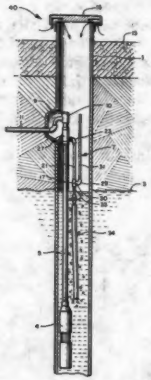
VENTURI ODOR DISSIPATOR

David A. Sherfinski, and William J. Raasch, both of Wausau, Wis., assignors to Sherfinski & Raasch Water Systems, Inc., Wausau, Wis.

Filed Mar. 8, 1985, Ser. No. 709,564

Int. Cl.[4] F04F *5/04;* F04B *23/08*

U.S. Cl. 417—87 13 Claims



1. A device for intermixing gas and liquid from a liquid source to deodorize the liquid, comprised of;

valve means for providing a unidirectional flow of said liquid from said liquid source;

diverting means for diverting a fraction of the unidirectional flow of said liquid;

means for atomizing said diverted fraction of said unidirectional flow of liquid;

means for mixing said atomized liquid and said gas; and

discharge means for discharging the mixture of said gas and said atomized liquid into said liquid source to deodorize and aerate the liquid.

4,624,627

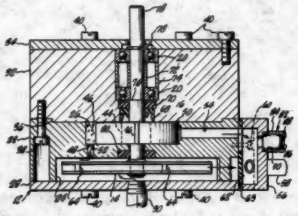
SELF-PRIMING PUMP

Larry M. Tunks, 16042 Mariner Dr., Huntington Beach, Calif. 92649

Filed Feb. 22, 1985, Ser. No. 704,164

Int. Cl.[4] F04B *23/14*

U.S. Cl. 417—199 A 10 Claims



1. A self-priming pump comprising:

(a) a casing comprising:

(i) a first impeller cavity having an inlet and a first output port;

(ii) a second impeller cavity having an intake port and a second output port; and

(iii) means permitting fluid to flow from the inlet to the intake port;

(b) a first impeller in the first impeller cavity for pumping a liquid from the inlet to the first output port;

(c) a second impeller in the second impeller cavity for pumping the liquid from the intake port to the second output port, the second impeller having a positive displacement for evacuating gas from the first impeller cavity;

(d) a shaft for rotating the first impeller and the second impeller;

(e) a manifold for connecting the first and second output ports to an outlet; and

(f) a flapper valve for preventing fluid flow from the connecting means to the first output port, the flapper valve moving within the manifold and closing against the first output port.

4,624,628

DOUBLE-DIAPHRAGM PUMPS

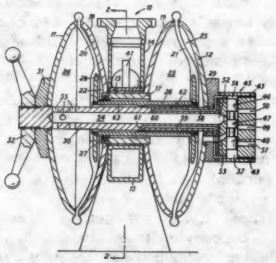
Derek N. Marchant, Hurstpierpoint, England, assignor to Flotronics AG, Zug, Switzerland

Filed Nov. 6, 1985, Ser. No. 795,665

Claims priority, application United Kingdom, Nov. 6, 1984, 8428013

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—393 6 Claims



1. A pump having a casing comprising a centre body and two end-caps disposed at opposite axial sides of the centre

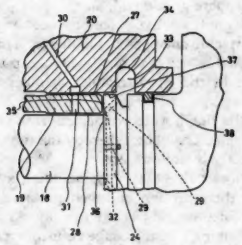
body and forming with centre body respective spaces, two diaphragms the outer edges of which are sealed with respect to the casing and which respectively divide the said spaces axially each into an axially inner chamber and an axially outer chamber, a hollow push-rod mounted for sealed reciprocating movement in the centre body to transmit axial displacing forces between the two diaphragms, a shaft extending axially in a sealing manner through the hollow push-rod and though the end-caps, passage means extending along the shaft for conveying operating fluid to and from at least one of the two axially outer chambers formed between the respective end-caps and their adjacent diaphragms, said push-rod co-operating with the shaft to control communication between said passage means and said one or both of said two axially outer chambers and means operating in conjunction with the shaft to clamp the end-caps to the centre body.

4,624,629

LUBRICATION MECHANISM FOR A TURBOCHARGER

Hiromi Murayama, and Naoki Minamoto, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 498,169, May 25, 1983, abandoned.
This application May 7, 1985, Ser. No. 731,608
Claims priority, application Japan, May 28, 1982, 57-91764
Int. Cl.[4] F04B *17/00*; F01M *1/00*
U.S. Cl. 417—407 **2 Claims**



1. A lubricating mechanism for a turbocharger, comprising:

a housing having an exhaust gas passage and an air suction passage formed therein and an oil inlet and outlet formed therein;

a turbine wheel mounted in said housing;

a compressor wheel mounted in said housing;

a rotatable shaft having mounted on one end thereof said turbine wheel so as to be positioned within said exhaust gas passage and on a second end thereof said compressor wheel positioned so as to be located within said suction passage, said rotatable shaft having a large diameter oil distribution portion formed thereon and having a flange which faces an inner periphery of said housing;

a bearing rotatably supporting said rotatable shaft in an axial direction within said housing and having a first end facing a first end surface of said oil distribtuion portion;

said housing having an oil lubricating passage formed therein for fluidically connecting said lubricating oil inlet to said lubricating oil outlet, said lubricating passage including first passage means formed between said housing and said bearing, second passage means formed between said rotatable shaft and said bearing and a plurality of third passage means formed circumferentially in said flange of said oil distribution portion to thereby connect said second passage means to a radially extending fourth passage means formed in a part of said housing which is juxtaposed to said turbine wheel wherein said housing has an oil communication passage formed therein and said bearing has an oil passage formed therein such that said oil communication passage of said housing is in communication with said first passage means and said oil passage means formed in said bearing, and such that said oil passage means formed in said bearing is in communication with said first passage means and said second passage means; and

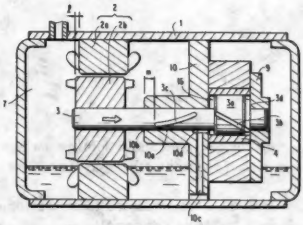
said rotatable shaft having a complete circumferential groove formed in said first end surface of said oil distribution portion and which is in communication with said second passage means and said third passage means so as to provide cooling of said housing wherein at least a portion of said complete circumferential groove is located between said third passage means and said second passage means and wherein said complete circumferential groove is formed so as to be located radially outwardly of the center of rotation of said rotatable shaft and adjacent said second passage.

4,624,630

DIFFERENTIAL PRESSURE LUBRICATION SYSTEM FOR ROLLING PISTON COMPRESSOR

Takuho Hirahara; Koji Ishijima; Fumiaki Sano; Fumio Wada; Kazutomo Asami, all of Shizuoka, and Masahiro Sugihara, Wakayama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 6, 1985, Ser. No. 708,905
Claims priority, application Japan, Mar. 8, 1984, 59-44548
Int. Cl.[4] F04C *18/356, 29/02*; H02K *3/04*
U.S. Cl. 418—63 **7 Claims**



1. In a rolling piston, sliding vane fluid compressor, particularly for refrigerant gases, including a closed shell (1), an electric motor (2) mounted within the shell, a shaft (3) rotatably driven by the motor at one end and adapted to turn with its axis disposed horizontally, a compressor cylinder (5) flanked by vertical side plates (9, 10) at its opposite ends and disposed with its axis parallel to the shafted axis and being mounted within the shell, an eccentric (3*a*) fixed to said shaft and abutting a bearing means on one of said side plates, the shaft extending through the cylinder and side plates and being journaled in bearings (9*a*, 10*a*) in the side plates, a hollow cylindrical rolling piston (4) disposed within the cylinder with its axis parallel to the shaft axis, said eccentric being rotatably disposed within the piston, a sliding vane (17) radially mounted in the cylinder and engaging the outer surface of the piston to define compression and suction chambers (6, 18), a suction inlet (19) to the suction chamber, a discharge outlet (22) from the compression chamber in communication with a space (7) within the shell, and a pool of lubricating oil (11) in a lower portion of the shell, an improved differential pressure lubrication system characterized by:

a substantially vertical oil supply passage (10*c*) having one end in communication with the oil pool and another, opposite end, in communication with a space (16) within the piston, said space being defined by said vertical side plates, the internal walls of said piston and the volume of the eccentric, whereby the pressure exerted on the oil pool by compressed refrigerant gas within the shell space forces oil through the supply passage and into the lower pressure piston space to thereby lubricate the moving parts of the compressor.

4,624,631

METHOD AND APPARATUS FOR GASIFYING AND COMBUSTING LIQUID FUEL

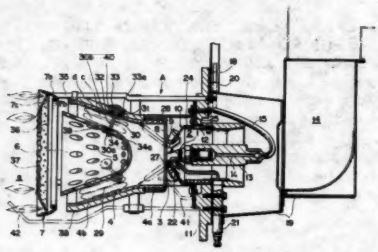
Hiroshi Kobayashi; Mikio Sawai; Junji Mieda, all of Shiga, and Seiichi Yoshikubo, Kitakyushu, all of Japan, assignors to Toto Ltd., Kitakyushu, Japan

Filed Apr. 10, 1985, Ser. No. 721,711

Claims priority, application Japan, Apr. 19, 1984, 59-79728; Oct. 13, 1984, 59-214483

Int. Cl.[4] F23M 3/00

U.S. Cl. 431—9 4 Claims



1. Apparatus for gasifying and combusting a liquid fuel so as to obtain at least predominantly blue flames, said apparatus comprising:

(a) a fuel spraying nozzle adapted to emit a conical spray of fuel defined by a first apex angle;

(b) an air blowing cylinder disposed coaxially with and so as to surround said fuel spraying nozzle;

(c) a porous burner cone disposed coaxially with and downstream of said fuel spraying nozzle, said porous burner cone comprising an at least generally cylindrical section and an at least generally conical section connected to said at least generally cylindrical section and flaring in the downstream direction at a second apex angle less than the first apex angle;

(d) said porous burner cone being sized, shaped, and positioned so as to surround the zone into which said fuel spraying nozzle sprays droplets of liquid fuel;

(e) said porous burner cone and said air blowing cylinder being spaced from one another to form a combustion gas suction inlet between the upstream end of said at least generally cylindrical section of said porous burner cone and the downstream end of said air blowing cylinder;

(f) said porous burner cone being made of an absorptive porous ceramic;

(g) a porous burner cup disposed coaxially with said porous burner cone;

(h) said porous burner cup being nested in said at least generally conical section of said porous burner cone;

(i) said porous burner cup having the form of a hollow cone with a bottom opened in the downstream direction;

(j) said porous burner cup having a plurality of small holes through the wall thereof except at the central portion around the apex thereof; and

(k) a flame holding ring disposed coaxially with and downstream of said porous burner cup.

4,624,632

FLAME FAILURE DEVICE

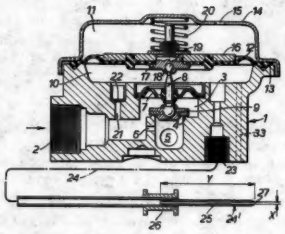
Hugh V. Barnes, Sutton Coldfiel, and William M. Russell, Arundel, both of England, assignors to T. I. Domestic Appliances Limited, London, England

Continuation of Ser. No. 628,561, Jul. 3, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 814,522

Claims priority, application United Kingdom, Jul. 6, 1983, 8318323; May 1, 1984, 8411064

Int. Cl.[4] F23N 5/00

U.S. Cl. 431—77 7 Claims



1. A flame failure device comprising

a heat sensitive member in the form of a fine bore tube open to atmosphere at one end, and

a fuel flow control valve assembly including means forming a pressurizable chamber and including a pressure-operated diaphram fuel flow control valve exposed to the fluid pressure in the pressurizable chamber to be operated thereby,

in which the fine bore is connected at the other end to the pressurizable chamber, whereby the tube vents the chamber directly to atmosphere,

said fuel flow valve assembly including a fuel passage extending therethrough and said pressure operated valve being located in said passage to control fuel therethrough, means forming a vent passage connecting said fuel passage upstream of said pressure operated valve with said pressurizable chamber,

the arrangement being such that the application of heat to a part at least of the fine bore tube causes the latter to reduce the venting of the chamber to atmosphere and the withdrawal of heat from the tube causes the latter to restore the venting to its prereduction value.

4,624,633

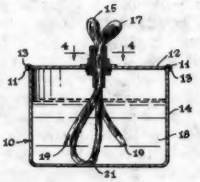
HIGH PERCENTAGE GLYCOL FUEL AND BURNER

David Bandel, Westminster, Calif., assignor to MTC-Choice, Inc., Harbor City, Calif.

Division of Ser. No. 690,026, Jan. 9, 1985, abandoned, and a continuation-in-part of Ser. No. 621,217, Jun. 16, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 811,141

Int. Cl.[4] F23D 3/24

U.S. Cl. 431—320 13 Claims



1. The combination of a novel fuel with a fuel canister and a

wick for transporting the said novel fuel from the interior to the exterior of the canister wherein the novel fuel comprises:

a combustible fuel having a flash point greater than 100° F. and comprising a minimum of 20% of a glycol.

4,624,634

METHOD AND ARRANGEMENT FOR IMPROVING THE HEAT ECONOMY IN ROTARY KILNS

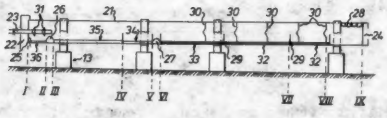
Bertil Pettersson, Gavle, Sweden, and Borje Thorsstrom, Grankulla, Finland, assignors to Termorak Oy, Helsinki, Finland

Filed Feb. 6, 1985, Ser. No. 698,639

Claims priority, application Sweden, Feb. 6, 1984, 8400578; Finland, Jan. 21, 1985, 850260

Int. Cl.⁴ F27B *15/18, 9/12, 7/14, 7/36*

U.S. Cl. 432—17 **18 Claims**



1. An arrangement for improvement of heat economy in the operation of a rotary kiln having a kiln chamber with discharge and feed ends, combustion, intermediate and drying zones arranged sequentially according to decreasing temeperature within the chamber, the combustion zone being adjacent the discharge end, comprising:

baffle means arranged centrally in the drying and intermediate zones for bringing the combustion gases into turbulence, each of said baffle means occupying 15–35% of the cross-sectional area of the kiln chamber;

means for achieving effective stirring of material in at least the drying and intermediate zones, in a region comprising approximately 30–60% of the total length of the kiln; and

one or more threshold means are disposed in the kiln chamber for controlling the material transit time in the kiln.

4,624,635

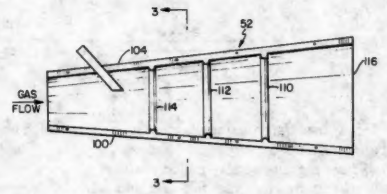
CONSTRUCTION FOR PULSE JET COMBUSTOR DEHYDRATION SECTION

Robert R. Gray, 7110 Via Monte Mar, Gladstone, Oreg. 97027, and Thomas G. Lindahl, 7325 SW. Mallard Ct., Portland, Oreg. 97223

Filed Oct. 3, 1985, Ser. No. 783,857

Int. Cl.⁴ F27B *15/00;* **B01D** *1/16;* **B01F** *15/06;* **F27D** *7/00*

U.S. Cl. 432—58 **2 Claims**



1. In pulse jet combustor apparatus for the drying of particulate material of the type having

a combustion chamber,

an air inlet conduit connected to one end thereof,

a primary exhaust gas outlet conduit connected to the other end thereof,

an elongated transition-tailpipe section connected to said primary exhaust conduits and a frusto-conically shaped drying section of increasing diameter connected to the downstream end of said transition-tailpipe section having means for introducing particulate materials to be dried therein,

the improvement wherein said drying cone includes a plurality of longitudinally spaced diminutive concentric rings mounted on the inner surface thereof to sequentially create selectively located perimetric turbulence in the portions of primary exhaust gas stream disposed adjacent said inner surface of said drying cone as it flows therepast.

4,624,636

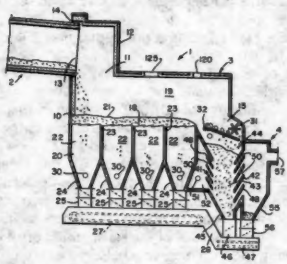
TWO STAGE MATERIAL COOLER

Daniel A. Willis, Whitehall, Pa., assignor to Fuller Company, Bethlehem, Pa.

Filed Apr. 5, 1984, Ser. No. 596,882

Int. Cl.⁴ F27D *15/02*

U.S. Cl. 432—78 **12 Claims**



1. A two stage cooler for cooling hot material discharged from a furnace comprising:

A first cooling apparatus for receiving hot material from a furnace including means for moving the material therethrough, means for passing a cooling gas in direct heat exchange contact with the material as it moves through the first cooling apparatus whereby the material is cooled and the cooling gas is heated, and means for conducting at least a portion of the thus heated cooling gas to the furnace;

a second cooling apparatus including a casing having end walls and sides defining a material shaft, an inlet for receiving material from the first cooling apparatus and an outlet for cooled material; said sides each being formed to define a plurality of gas passageways spaced apart along the sides of the material shaft between the inlet and the outlet; means for passing cooling gas from one side of the material shaft through the gas passageways therein, through the material in the material shaft for direct heat exchange contact with the material therein for further cooling the materials.

the material shaft of the second cooling apparatus being dimensioned so that at least some of the cooling gas passes through the other side of the material shaft substantially perpendicular to the flow of material from the inlet to the outlet; and

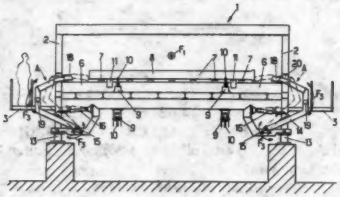
the means for passing gas through the side is positioned with respect to the inlet for receiving material from the first cooling apparatus so that at least some of the gas flows through said one side and flows through the material to the material inlet, counter current to the flow of material through the material shaft and directly through the first cooler apparatus for supply to the furnace.

4,624,637

ROLLING PIPE CENTERING APPARATUS

Rene Genesio; Jean P. Martinez, and Romain Schmitt, all of Pont-A-Mousson, France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Sep. 9, 1985, Ser. No. 773,727
Claims priority, application France, Sep. 10, 1984, 84 13860
Int. Cl.[4] F27D *3/00*; F27B *9/14*; B65G *47/26*
U.S. Cl. 432—239 9 Claims



1. An apparatus for handling elongate cylindrical pipes (8), comprising:

(a) a furnace (1) including a horizontal bed (6) and opposite side walls (2),

(b) a pair of spaced parallel rails (7) mounted on the bed between the side walls,

(c) conveyor means (9, 10) for rolling pipes disposed laterally across the rails over the rails from an entry end of the furnace to an exit end thereof, and

(d) at least one positioning device disposed between the entry and exit ends of the furnace for re-centering laterally displaced pipes, said device comprising two separate and independence stop members (18) disposed facing each other on opposite sides of the rails, and control means (16) for moving the stop members between a retracted position whereat they are withdrawn from a path of movement of the pipes and from the interior of the furnace, and an extended position whereat they project into the furnace and abut the ends of a displaced pipe rolling between them to transversely re-center the pipe, wherein

(e) the stop members are individually mounted on upper ends of two symmetrically elbowed arms (14) disposed substantially outside of the furnace and whose other, lower ends are articulated about spaced axes (15) disposed parallel to the direction of conveyance of the pipes and below the bed and rails, said upper ends of the arms extending into the furnace through access ports (20) in the side walls thereof, and

(f) the control means are articulated to the elbowed arms and similarly disposed below the bed and rails, whereby free and unobstructed access is provided along the side walls, outside of the furnace, at the level of pipe conveyance.

4,624,638

CVD BOAT LOADING MECHANISM HAVING A SEPARABLE, LOW PROFILE CANTILEVERED PADDLE ASSEMBLY

Robert F. Sarkozy, Westford, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Filed Nov. 29, 1984, Ser. No. 676,086
Int. Cl.[4] F27D *5/00*; A47J *45/00*; B65G *25/00*
U.S. Cl. 432—253 12 Claims

1. A mechanism for loading and removing plural wafers into and out of a chemical vapor deposition diffusion furnace having an entrance vestibule, comprising:

a boat loader;

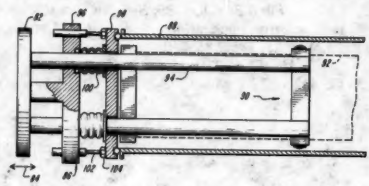
an enlongated member having ends mounted to said boat loader in cantilevered fashion such that one of said ends defines a supported end and the other of said ends defines a free end;

a furnace door mounted in gas-tight relation to said elongated member at a point thereof adjacent said supported end and remote from said free end;

a paddle for supporting a plurality of wafer loaded boats;

said paddle consisting of a longitudinally extending semi-cylindrical member of a refractory material defining a low-profile when inside the diffusion furnace;

a clamp fastened to said free end of said elongated member for releaseably retaining said paddle to said free end of said elongated support in cantilevered fastion;



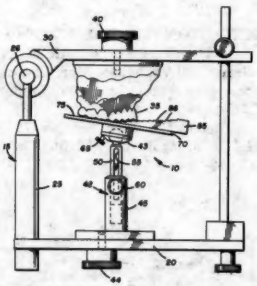
said clamp including a first ring-like member, a second ring-like member spaced apart from the first ring-like member along the free end of the elongated member, said first and second ring-like members individually being configured and together being aligned to slidably receive and to support said semi-cylindrical refractory member in cantilevered fashion.

4,624,639

ADJUSTABLE OCCLUSAL PLANE TABLE AND METHOD OF USE FOR ORTHOGNATHIC SET-UPS

Brian W. Wong, 1672 Toyon Ct., San Mateo, Calif. 94403

Filed May 1, 1985, Ser. No. 729,276
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—56 9 Claims



1. In an articulator having a dental arch model mounted thereon, a referencing apparatus comprising:

a table having a generally planar surface;

means for supporting said table on said articulator opposite to said arch model, including three dimensional adjustment means for positioning said planar surface at a selected plane with respect to said arch model; and

means for recording the position of said arch model with respect to said planar surface and for measuring any changes in said arch model position with respect to said planar surface said means including graph paper positioned on said planar surface having grid lines of predetermined spacing along the x and y axes thereof corresponding to the x-y plane of said planar surface and an intrusion ruler having a plurality of steps of increasing height along

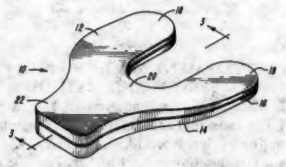
the length of said ruler, each said step being a predetermined height.

4,624,640

WAFER FOR A DENTAL IMPRESSION FOR IDENTIFICATION PURPOSES

David A. Tesini, 29 Knowles Ave., Auburn, Mass. 01501

Filed Nov. 6, 1984, Ser. No. 668,737
Int. Cl.[4] A61C *9/00*
U.S. Cl. 433—71 **5 Claims**



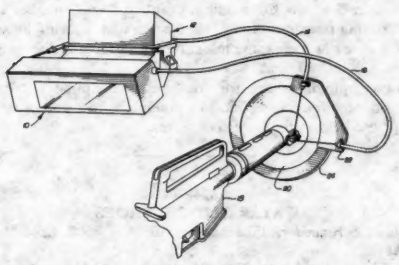
1. A wafer for taking a simultaneous impression of upper and lower teeth, comprising upper and lower layers of impressionable material separated by a layer of ductile material, said wafer having a pair of laterally spaced portions to receive the impression of the molars and being thick enough to record the shape of the molars from the biting surface substantially to the gum line, and a thicker anterior portion extending between the posterior portions and positioned to receive an impression of the front teeth from the biting edge substantially to the gum line.

4,624,641

LASER SIMULATOR FOR A FIRING PORT WEAPON

Lawrence J. Gallagher, Arcadia, Calif., assignor to Loral Electro-Optical Systems, Pasadena, Calif.

Filed Oct. 22, 1984, Ser. No. 663,226
Int. Cl.[4] F41G *3/22*
U.S. Cl. 434—21 **10 Claims**



1. A weapon simulator for a firing port weapon fired through a gun port and aimed through a separate view port, comprising:

(a) a housing, mounted adjacent the view port, having a first wall adjacent the view port defining a first viewing aperture and a second wall, oposite the first wall, defining a second viewing aperture;

(b) a laser for simulating weapon firing mounted within the housing;

(c) a stationary visible spot light source for aiding in weapon aiming, mounted within the housing such that the laser and visible light source direct their respective beams towards each other;

(d) a partially reflective mirror rotatable mounted within the housig between the laser and the visible spot light source, said mirror reflecting the visible light beam through the second viewing aperture toward a weapon user and the laser beam through the first viewing aperture and the view port;

(e) a co-moving linkage connecting the weapon and the mirror for coordinated movement of the mirror in correspondence with movement of the weapon, the laser beam and visible light source beam thereby being reflectively directed by the movable mirror in coordination with movement of the weapon, so that the weapon user sees the actual visual target background through the second viewing aperture, the mirror, the first viewing and the view port, and sees superimposed on said visual background an aiming spot comprising the beam from the stationary visible spot light source reflected by said mirror through said second viewing aperture to said user, movement of said mirror in coordination with movement of the weapon causing the beam from the stationary spot light source to be reflected at a different angle to the weapon user, so that said aiming spot appears to the user to move across the visual backgrund, the position of the reflected spot coinciding with the direction of the laser beam refleted toward the target, so that as the laser beam simulates firing of the weapon, the reflected visible light beam from the stationary spot light source present a visible aiming cue to the weapon user; and

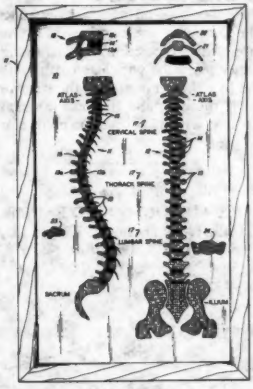
(f) electronic means for actuating the laser and the visible light source.

4,624,642

VERTEBRAE DEMONSTRATION APPARATUS

Angelo N. Ferrara, 1845 Union Center Hwy., Endicott, N.Y. 13760

Filed Mar. 18, 1985, Ser. No. 713,179
Int. Cl.[4] G09B *23/32*
U.S. Cl. 434—274 **7 Claims**



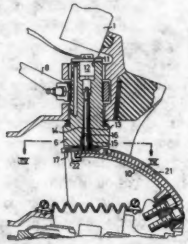
1. Apparatus for demonstrating spinal conditions, comprising, in combination: a magnetically-permeable panel having a smooth surface carrying a plurality of fixed indicia representing bone elements of a normal human spine and the central nervous system associated therewith; and a plurality of movable pieces having shapes corresponding to respective ones of said indicia, each of said movable pieces comprising a non-magnetic member having magnetic means affixed to it, each of said magnetic means being operable to normally hold a respective movable piece in place on said panel but allow said movable piece to be slid on said surface of said panel.

4,624,643

BOAT PROPELLER DRIVE UNIT WITH TRIM/TILT SENSOR

Lars-Erik Ohlsson, Hisings Backa; Ulf Söderbaum, Skärhamn, and Kjell Borgersen, Hjälteby, all of Sweden, assignors to AB Volvo Penta, Goteborg, Sweden

Filed Sep. 18, 1984, Ser. No. 651,846
Claims priority, application Sweden, Sep. 19, 1983, 8305027
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—2 **7 Claims**



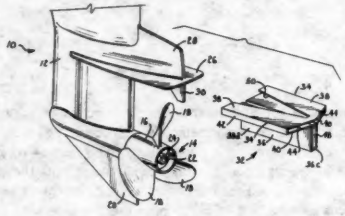
1. In a boat propeller drive unit of the type which has a portion securely mounted in an opening in a boat transom and designed to be drivingly connected to a motor placed inside the transom, and a propeller leg disposed outside the transom, said leg being adjustable to various angles in relation to the transom by tilting about a horizontal axis and pivotable about an upright steering shaft, said drive unit comprising means for providing to an instrument an output signal dependent on the tilting angle relative to the transom, which signal indicates said angle; the improvement in which said means comprise a signal emitter spaced from the tilt axis and having means extending through the steering shaft and cooperating with a position sensor which is joined to the propeller leg and extends in a circular arc having the tilt axis as its center, in order to actuate the signal emitter to send a signal dependent on the tilting angle of the propeller leg relative to the steering shaft, the signal emitter and the position sensor having elements which cooperate mechanically with each other, the signal emitter being joined to a shaft mounted in the steering shaft, said shaft having a gear thereon, and the position sensor comprising a toothed segment which is curved in a circular arc with the tilt axis as its center.

4,624,644

STOP DEVICE FOR OUTBOARD ENGINE PROPELLERS

William E. Hall, 12809 Oakmont, Kansas City, Mo. 64145

Filed Dec. 5, 1984, Ser. No. 678,292
Int. Cl.[4] B63H *1/14*
U.S. Cl. 440—49 **14 Claims**



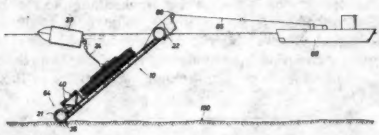
1. A propeller stop device for application to an outboard marine engine which includes a submersible column having a projecting fin structure and a rotary propeller beneath said fin structure having spaced apart blades and a retaining nut for holding the propeller on the column, said device comprising a rigid stop member for retaining the propeller against rotation and means for detachably securing said stop member to the column at a location to extend between adjacent blades and to serve as a stop acting against one of the blades in a manner to hold the propeller against rotation while the retaining nut is being tightened and loosened, said detachable securing means including a hollow body having a size and shape to fit on the fin structure to removably secure said body thereon, said stop member extending from said body at a location to engage the propeller blades when the body is fitted on the fin structure.

4,624,645

RAPID DEPLOYMENT MOORING AND DISCHARGE SYSTEM AND METHOD

Willian L. Kiely, Cypress, and Kristen I. Pedersen, Houston, both of Tex., assignors to Sofec, Inc., Houston, Tex.

Continuation of Ser. No. 578,586, Feb. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 503,638, Jun. 13, 1983, abandoned. This application Jun. 27, 1985, Ser. No. 749,140
Int. Cl.[4] B63B *21/52*
U.S. Cl. 441—4 **36 Claims**



14. An offshore bulk liquid discharge system comprising a base,

buoyancy tank means attached to the base for providing flotation for the system during transportation of the system to a mooring location and adapted for flooding to allow the system to be disposed on the sea floor,

hose reel means for holding a coil of flexible tanker hose during transportation of the system to a mooring location and for unreeling the hose after the system is disposed on the sea floor, and

swivel piping means for rotationally coupling a conduit adapted for connection to a pipeline with a coil of tanker hose held in the hose reel means.

4,624,646

WATER GLIDING SHOES

Helmut Strohmeier, Pötschenweg 10, A - 8605 Kapfenberg, Austria

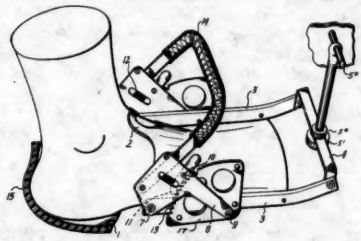
Filed Aug. 22, 1984, Ser. No. 643,115
Claims priority, application Austria, Sep. 1, 1983, 3138/80
Int. Cl.[4] A63C *9/085*
U.S. Cl. 441—76 **13 Claims**

1. Binding for supporting a foot on a foot-supporting surface of a water gliding shoe, said binding comprising vertically reciprocable holding-down means with a flexible instep-engaging portion stretchable across the instep adapting itself to the shape of the foor and pressing the foot against a support in a depressed position of the holding-down means; wherein the holding-down means is arrestable in various vertical positions as for adaption to foot size or holding strength desired by a user;

wherein the holding-down means is fixedly mounted on legs adapted to straddle the foor and the legs are joined to a vertically reciprocable holding-down shackle;

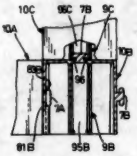
wherein the holding-down shackle is pivotable around a

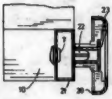
swivelling axis arranged horizontally in front of the foot and transversely to a longitudingal axis of the binding; and



wherein the swivelling axis extends on a guide rod pivotable around a fixed axis of rotation.

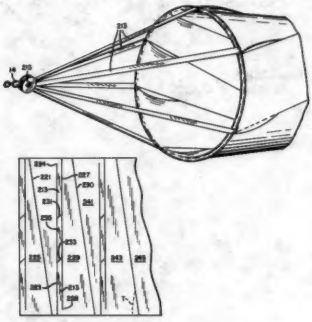
4,624,647
BUILDING ELEMENT WITH INTERNAL STUD-RECEIVING MEANS
René Munnix, 72a, Route de Maastricht, 4651 Battice, Belgium
Filed Jan. 10, 1985, Ser. No. 690,471
Claims priority, application Belgium, Jan. 11, 1984, 212188
Int. Cl.[4] A63H *33/08*
U.S. Cl. 446—120 **4 Claims**





1. An element for building block system comprising a plurality of block elements to be assembled to one another in spatial configuration, said element comprising a hollow substantially prismatic body with lateral walls and a top base wall, at least one of said walls having a male assembling stud protruding externally therefrom, said assembling stud comprising a body protruding from said one wall and ending with a head which is wider than said body, and at least one of said lateral walls having a female assembling means for engagement with a said assembling stud provided on a face of another element of said system, the female assembling means consisting of a first generally rectangular-shaped aperture which is wider than the head of said male assembling stud and a second aperture adjacent to and communicating with the first aperture and centrally located with respect to one side of said first aperture, said second aperture having a lesser width than that of the head of said male assembling stud and at least as great as the width of the stud body, the wall comprising said second aperture being formed internally with means including a channel adapted tightly to engage with the head of one of said male assembling studs on another of said elements, whereby said another element is connected to the element in hook-up engagement in a face-to-face arrangement, said top base wall having internally a protruding hollow encasing means of a generally prismatic shape dimensioned so as to engage for connection therewith the head of said male assembling stud on another element, said hollow encasing means being constituted by a number of lamellae delimiting an internal opening for enclosing the head of a said male assembling stud, said element having means at the side remote from said top base for providing access to said encasing means by a said male assembling stud.

4,624,648
AERIAL TOY
John R. Waters, Lincoln City, Oreg., assignor to Catch the Wind Kite Shops, Inc., Lincoln City, Oreg.
Continuation of Ser. No. 747,364, Jun. 21, 1985, abandoned, and a continuation-in-part of Ser. No. 735,840, May 20, 1985, abandoned. This application Jun. 24, 1985, Ser. No. 748,181
Int. Cl.[4] A63H *29/10*
U.S. Cl. 446—176 **12 Claims**



7. An aerial toy comprising:
a sleeve of flexible material, such sleeve being of circular cross section,
one end constituting a head end providing an air entry mouth,
the other end constituting a tail end,
means on said toy for causing a build-up of pressure within said sleeve when it is subject to wind flow,
said head end adapted for a bridle connection for supporting said tubular sleeve for wind passage relative thereto,
said sleeve comprising plural strips of substantially the same size extending at least generally longitudinally of said sleeve,
said strips being arranged annularly in side-by-side relationship,
all of said strips being joined together in an annular relationship with each strip being joined with an adjacent strip with the junctures stopping short of the head ends of the strips and with a step being provided at the head end portions of adjacent ones of said strips.

11. The method of producing a rotary aerial toy comprising:
providing plural essentially right triangular strips of flexible material, said strips each being of substantially the same size and having a head end and a tail end,
seam-securing the strips to one another with the hypotenuse leg of each said strip in contact with the altitude leg of an adjacent one of said strips and with the head ends of the altitude legs terminating substantially the same distance short of the head ends of the hypotenuse legs,
and terminating the seam securements short of the head ends

of the altitude legs so as to leave mutually adjacent margins of the head ends of said altitude legs free of each other.

12. The method of producing a rotary aerial toy comprising:

providing a sheet of flexible material having parallel edges,

producing sever lines through said sheet, certain of said sever lines intersecting said edges to divide the sheet into plural mutually discrete sections, other of said sever lines terminating short of at least one of the parallel edges to form integral bridle lines having free ends,

said sections having head ends and tail ends,

securing the head ends of said sections together to form a mouth for reception of an airstream,

said securement being in such a fashion as to leave said bridle lines dangling free except for integral securement at said mouth,

otherwise securing said sections together in spaced relation from said mouth to provide structure to cause said aerial toy to rotate when an airstream passes into said mouth,

securing the free ends of said bridle lines together to form a bridle.

4,624,649

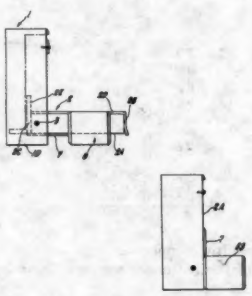
TOY FURNITURE DEVICE, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Shirley L. Blocker, 5445 M-140, Eau Claire, Mich. 49111

Filed Apr. 22, 1985, Ser. No. 726,881

Int. Cl.[4] A63H *3/52*

U.S. Cl. 446—482 **11 Claims**



1. A toy furniture device, comprising:

a box-shaped main frame member;

a fold-down bed member; and

said bed member having one end portion thereof pivotably attached to said main frame member to permit pivotal movement of said bed member between a stored position wherein said bed member is disposed substantially within said main frame member, and a folded-down position wherein said bed member extends substantially perpendicularly outwardly from said main frame member;

said box-shaped main frame member having an open box configuration defined by an upper side wall, a lower side wall, a right side wall, a left side wall and a back panel joined to said sidewalls;

said bed member including a bottom foundation panel which defines a closed front side of said main frame member when said bed member is pivoted to said stored position;

said bed member having a substantially closed-box configuration defined by said bottom foundation panel, a foot side wall, a head side wall, a right side wall, a left side wall and an upper mattress-defining wall;

said right and left side walls of said bed member being respectively pivotably attached to said right and left side walls of said main frame member, adjacent said head side wall of said bed member, such that a head portion of said bed member is disposed within said main frame member in both said stored position and said folded-down position of said bed member;

said head side wall of said bed member being provided with an upwardly extending integral head board portion; and

said head board portion extending substantially vertically when said bed member is disposed standing in said folded-down position thereof, and extending substantially adjacent and parallel to an inner surface of said lower side wall of said main frame member when said bed member is disposed in said stored position thereof.

4,624,650

TORSIONAL VIBRATION ABSORBER DEVICE

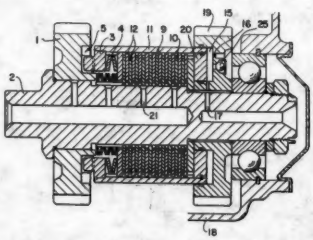
Masao Hiruma; Hiroshi Nakayama, both of Saitama, and Michio Suzuki, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 572,611, Jan. 23, 1984, abandoned, which is a division of Ser. No. 326,746, Dec. 2, 1981, abandoned. This application Jul. 22, 1985, Ser. No. 757,754

Claims priority, application Japan, Dec. 8, 1980, 55-172062; Dec. 8, 1980, 55-172063

Int. Cl.[4] F16D *3/14*

U.S. Cl. 464—26 **4 Claims**



1. A tortional vibrational absorbed comprising

a shaft;

a rotary input member rotatably mounted relative to said shaft about said shaft;

a rotary output member fixed to said shaft;

a case rotatably mounted relative to said shaft about said shaft;

a friction clutch mounted about said shaft within said case and including friction plates, at least one of said friction plates being fixed to rotate with said shaft and at least one other of said friction plates being fixed to rotate with said case;

engagement means for driving said case with said rotary input member, said engagement means including a first cam on said rotary input member extending axially and a second cam fixed to said case and extending axially to driveably engage said first cam, said first and second cams constructed to move axially upon relative rotational camming movement therebetween to increase the torque transmitting capacity of said friction clutch by providing an incrased axial clamping compression of said friction plates;

a first shoulder on said engagement means axially abutting one end of said friction clutch;

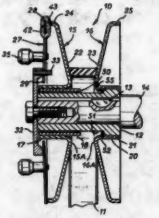
a second shoulder about said shaft, fixed axially thereto and axially engaging the other end of said friction clutch; and

a spring, said spring being disposed between said engagement means and said friction clutch for initially providing axially clamping compression on said friction plates to provide an initial torque transmitting capacity between said input member and said output member.

4,624,651
VARIABLE SPEED DRIVE PULLEY

Michel Jaccod, Champigny sur Marne, France, assignor to Valeo, Paris, France

Filed Oct. 16, 1984, Ser. No. 661,466
Claims priority, application France, Oct. 21, 1983, 83 16760
Int. Cl.[4] F16H *55/56, 11/06*
U.S. Cl. 474—13 19 Claims

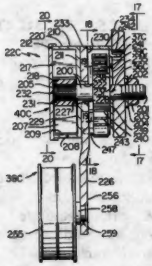


1. A variable speed drive pulley comprising a hub having an axis, two annular flanges disposed around said hub in axial face-to-face relationship, at least one of said flanges being a mobile flange axially movable between a retracted position in which said mobile flange is relatively remote from said other flange and an advanced position in which said mobile flange is relatively close to said other flange, elastic control means responsive to centrifugal force for moving said mobile flange towards said other flange, a transmission belt received between said flanges and movable radially in accordance with the axial position of said mobile flange, a bearing surface and an elastic bearing member fixed relative to respective ones of said flanges the bearing surface and the bearing member being located remote from each other when said mobile flange is in said retracted position, and the bearing surface and the bearing member being arranged to come into engagement with each other when said mobile flange reaches said advanced position for exerting an elastic force opposing the movement of said mobile flange toward said other flange.

4,624,652
BELT TENSIONER, PART THEREFOR AND METHODS OF MAKING THE SAME

Randy C. Foster, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 391,643, Jun. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 301,351, Sep. 11, 1981, Pat. No. 4,413,982. This application Jul. 20, 1984, Ser. No. 633,154
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.[4] F16H *7/12, 7/14*
U.S. Cl. 474—135 3 Claims

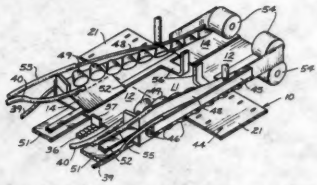


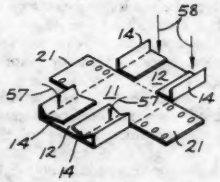
1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means, said dampening means having a movable means and a longitudinal axis on which said movable means moves, said spring means having a longitudinal axis and being spiraled about said axis thereof, said support means comprising a shaft means having a longitudinal axis and being fixed from movement relative to said belt engaging means, the improvement wherein said shaft means carries said dampening means and said spring means in spaced apart side-by-side relation thereon with said axis of said shaft means being substantially coaxial with said axes of said dampening means and said spring means whereby said dampening means and said spring means are coaxially spaced apart and are coaxially aligned to said shaft means, said belt engaging means having a portion thereof disposed between said dampening means and said spring means and being rotatably carried by said shaft means so as to rotate relative to said shaft means whereby said dampening means and said spring means are coaxially spaced apart from each other by said portion of said belt engaging means, and a tubular portion rotatably disposed on said shaft means to rotate relative thereto, said portion of said belt engaging means being disposed on said tubular portion and being operatively interconnected thereto whereby said portions rotate in unison relative to said shaft means, said tubular portion extending beyond said portion of said belt engaging means and comprising at least part of said movable means of said dampening means.

4,624,653
CORNER LAMINATING APPARATUS AND METHOD FOR CARTONS

Jerald McBride, Spokane, and Richard Lile, Veradale, both of Wash., assignors to R. A. Pearson Co., Spokane, Wash.

Filed Sep. 9, 1985, Ser. No. 774,143
Int. Cl.[4] F16H *7/22*
U.S. Cl. 493—127 8 Claims





1. In an apparatus for laminating the upright corners of a tray or carton formed from a blank that includes a bottom panel, end panels joined to the bottom panel along first scored

lines at opposite ends of the bottom panel, corner flaps joined to each end panel along second scored lines at opposite sides of the end panels and including at least three sections in each corner flap adapted to be folded relative to one another about parallel third and fourth scored lines, and side panels joined to the bottom panel along fifth scored lines at opposite sides of the bottom panel, the improvement comprising:

a hopper for storing a stack of blanks;

delivery means adjacent to the hopper for discharging individual blanks from said hopper and for continuously transporting them along a path parallel to the third and fourth scored lines joining their corner flap sections;

first means along said path for folding the corner flaps relative to the end panels about said third scored lines;

second means along said path for folding the corner flaps relative to the end panels about said second scored lines;

third means along said path for sequentially folding the corner flap sections relative to one another along the third and fourth scored lines to form a laminated configuration along the side edges of each end panel during transport of a blank along said path;

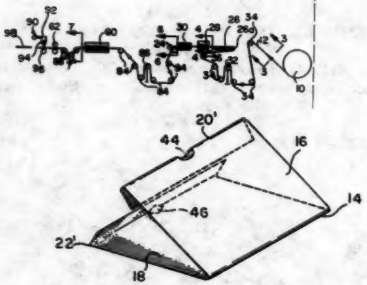
and means along said path for adhesively securing the outermost section of each corner flap to the end panel joined to it.

4,624,654

METHOD AND APPARATUS FOR MANUFACTURING DRAW TAPE BAGS

Dana M. Boyd, Rushville, and Franz Bustin, Rochester, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,254
Int. Cl.[4] B31B *1/64*
U.S. Cl. 493—194 **13 Claims**



1. A method of forming bag bodies comprising the steps of:

providing a continuous length of pliable bag material folded once longitudinally and having a longitudinal fold edge, and two adjoining material layers each with longitudinal free edge opposite the longitudinal fold edge;

folding the two longitudinal free edges inwardly between said adjoining layers to provide a pair of longitudinal hems of double layer thickness opposite said longitudinal fold edge;

inserting a separate, continuous material strip into each hem, said pliable bag material being continuously and uninterruptedly advanced through said folding and inserting steps;

longitudinally joining together the double layer thicknesses of each hem to form a channel along the longitudinal edge of each layer opposite the longitudinal fold containing one of the continuous strips; and

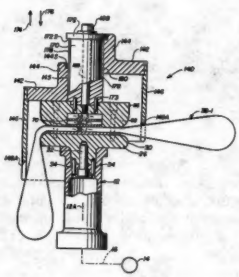
transversely severing the pliable bag material and strips at regular intervals along the length of the pliable bag material to separate individual bag body lengths from the continuous length of pliable bag material.

4,624,655

RESTORING CAP ASSEMBLY FOR A CENTRIFUGE ROTOR HAVING A FLEXIBLE CARRIER

Paul M. Cole, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1984, Ser. No. 684,936
Int. Cl.[4] B04B *5/02*
U.S. Cl. 494—20 **17 Claims**



1. A swinging bucket centrifuge rotor for exposing a sample to a centrifugal force field comprising:

a central hub connectable to a source of motive energy for rotating the hub about an axis of rotation;

a sample carrier flexibly connected to the hub, the sample carrier being adapted to support the sample during movement of the same in response to centrifugal force from a first, rest, position in which the axis of the carrier is substantially parallel to the axis of rotation to a second position in which the axis of the carrier is substantially perpendicular to the axis of rotation;

a cap assembly mountable to the rotor for rotation therewith, the cap assembly being responsive to centrifugal force as the rotor is spun by moving from an initial to a final position to permit the carrier to move from the first to the second position, the cap assembly being further responsive to gravity as the rotor slows to move toward the initial position, the cap being arranged to interact with the sample carrier as the cap responds to gravity thereby to assist in the restoration of the carrier to the first position.

4,624,656

HYPERBARIC GAS TREATMENT DEVICE

David W. Clark, Fairhaven, and George J. Jablonsky, Highlands, both of N.J., assignors to Hospitak, Inc., Lindenhurst, N.Y.

Continuation-in-part of Ser. No. 516,573, Jul. 25, 1983, abandoned. This application Dec. 24, 1984, Ser. No. 685,749
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—23 **20 Claims**

1. A hyperbaric gas treatment device for therapeutic topical treating of skin lesions, comprising:

a resilient pad having a centrally apertured surface as a major side thereof;

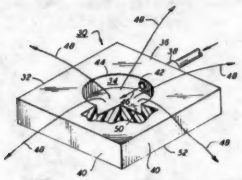
means for conducting pressurized treating gas into the central aperture of said surface; and

means for constraining the pressurized gas flowing into said aperture to escape from said aperture only past the aperture periphery at said surface;

said central aperture extending partially through the pad towards another major side thereof, said constraining means including the pad material disposed between the

bottom of said central aperture and said other major side of said pad;

said surface being yieldably pressable against the skin of a patient to circumscribe said aperture periphery substan-



tially about a lesion of the skin and, upon conduction of pressurized treating gas into said aperture, to provide gas escape paths between the skin and said surface in which the escaping gas flows from said aperture periphery to atmosphere.

4,624,657

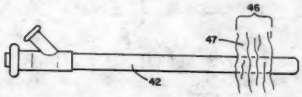
MEDICAL DEVICES HAVING INFLATABLE PORTIONS

Arnold S. Gould, Bedford, and Michael A. Ciannella, Marlboro, both of Mass., assignors to Medi-Tech, Incorporated, Watertown, Mass.

Filed Nov. 15, 1983, Ser. No. 551,861

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—103 **12 Claims**



1. A medical device comprising

a flexible, elongated, tubular member of uniform wall thickness having a continuous, smooth outer surface of uniform outer diameter, adapted for introduction into the body,

said tubular member comprised of heat-sensitive elastomer, said tubular member, as formed, having a predetermined resistance to expansion,

a selected, limited-length tubular portion of the wall of said tubular member being in a post-formation, annealed, weakened state while adjacent portions of said tubular member are not so annealed, the wall of said selected portion having a lower resistance to expansion than said adjacent portions of said wall having uniform thickness, and

a connection for introducing inflation fluid into the space defined by the length of said tubular member,

said selected limited-length portion by reason of said annealed state, adapted to preferentially respond to pressure of inflation fluid within said tubular member by expanding transversely to a balloon shape larger than said adjacent portions of said tubular member that are subjected to the same pressure.

4,624,658

DISTENSIBLE SYRINGE AND SENSOR FOR INJECTORS

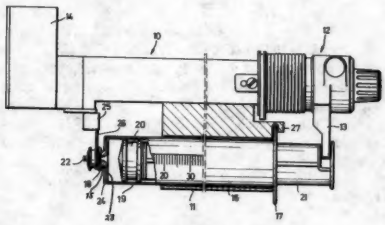
Robert Mardorf, and Friedrich von der Haar, both of Melsungen, Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Nov. 5, 1984, Ser. No. 667,997

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340511

Int. Cl.[4] A61M *5/20*

U.S. Cl. 604—121 **11 Claims**



1. A syringe for injectors, comprising:

a cylinder having a deformable wall portion, a longitudinal wall, a first and a second end, an outlet end wall dsposed at said first end, and a neck disposed on said outlet end wall;

a piston, disposed in said cylinder; and,

means, disposed in contact with a region of said cylinder which moves upon distension of said deformable wall portion, for providing an output signal proportional to said distension of said deformable wall portion.

4,624,659

SYRINGE WITH PRESSURE SENSING MEANS

Edward M. Goldberg, 225 Maple Hill Rd., Glencoe, Ill. 60022, and Seymour Bazell, 9235 North Latrobe, Skokie, Ill. 60077

Filed Sep. 24, 1985, Ser. No. 779,492

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—121 **18 Claims**

1. An instrument for injecting and withdrawing fluids while providing an indication of the pressure applied thereby, comprising:

a hollow barrel which is closed at its distal end and open at its proximal end:

a plunger mounted in said barrel for longitudinal movement therein,

said plunger including piston means for sealingly engaging the inner surface of said barrel, said plunger further defin-

ing a chamber within said barrel between said distal end of said barrel and said piston means;

hollow tip means, disposed at said distal end of said barrel, for conducting fluid into and out of said chamber; and,

sensing means, in fluid communication with said chamber and disposed adjacent said proximal end of said barrel, for indicating the pressure in said chamber.

4,624,660

AUTOMATIC INJECTION DEVICE

Jan W. M. Mijers, and Gillis P. van der Wal, both of Olst, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Filed Oct. 1, 1985, Ser. No. 782,697

Claims priority, application Netherlands, Nov. 2, 1984, 8403326

Int. Cl.[4] A61M 5/20

U.S. Cl. 604—136 6 Claims

1. An automatic injection device comprising an assembly of a discharge mechanism, a cartridge holder of a synthetic material and a cartridge which is slidably accomodated in the cartridge holder, which cartridge comprises a glass ampoule, if desired enveloped by a sheath of shrinkable sheet, said ampoule consisting of an ampoule cylinder in which an injection liquid or various injection liquids separated from each other by stoppers and a piston which can be moved in the ampoule cylinder are provided, a connection means for an injection needle in which or to which the injection needle, if desired, covered by a guard to maintain the needle in a sterile condition, is connected, and a shoulder between ampoule cylinder and needle connection means, the cartridge holder consisting of a sleeve-like rear portion which is open at each end and which, after actuating the injection device, is traversed by the ampoule cylinder and the inner surface of which has substantially the same transverse dimensions over the whole length, and a front portion which forms one assembly with the sleeve-like portion and, after actuating the syringe, serves to discontinue the forward movement of the cartridge in the holder and to allow passage of the needle, characterized in that the sleeve-like portion of the cartridge holder has a five-sided to fourteen-sided cross-section over a length which is at least equal to the length of the ampoule cylinder and is proportioned such that the ampoule cylinder engages the inner side surfaces of said sleeve-like portion with friction.

4,624,661

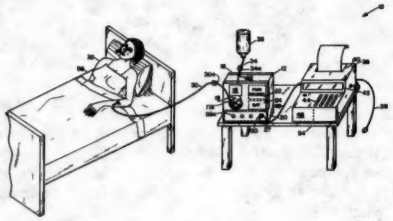
DRUG DISPENSING SYSTEM

Timothy V. Arimond, Minneapolis, Minn., assignor to Surgidev Corp., Santa Barbara, Calif.

Continuation of Ser. No. 442,039, Nov. 16, 1982, abandoned. This application May 6, 1985, Ser. No. 730,434

Int. Cl.[4] A61M 37/00

U.S. Cl. 604—151 27 Claims



1. Drug dispensing system comprising:

a. means for external programming control including a first CPU including a first memory means including a plurality of drug dispensing algorithms stored therein, key pad input means connected to said first memory means for selecting one of said algorithms and inputting parameters for said algorithm therein, display for self-prompting as well as viewing-selected input, printer means providing hard copy; and,

b. means for drug pump dispensing including a second CPU including second memory means for storing an algorithm with selected parameters inputted only from said external programming control means, discrete real-time clock and calendar means for controlling predetermined levels of drug dispensing and connected to said second CPU, drug reservoir means, pump means connected to said drug reservoir means for pumping a drug through a tube to a patient, motor means for said pump means connected to said second memory means for driving said pump means, and visual indicator means indicating status of said pump means.

4,624,662

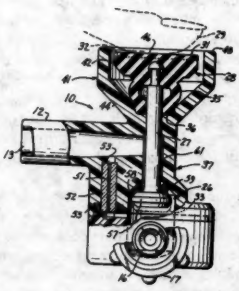
CATHETER FLUSHING SYSTEMS

Da H. Le, Pasadena, Calif., assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Continuation-in-part of Ser. No. 444,300, Nov. 24, 1982, abandoned. This application Apr. 13, 1983, Ser. No. 483,207

Int. Cl.[4] A61M 5/00; F16K 51/00

U.S. Cl. 604—249 34 Claims



1. In a method of making a valve enabling flushing of a

catheter intermittently at a flushing flow rate higher than a seeping flow rate, said valve being connectable between a supply of flushing liquid and the catheter and having a valve stem and a manually actuable valve operator on an end portion of the valve stem and engageable by a human finger for depression from a rest position, in which the valve is closed to flushing at the flushing flow rate, to a depressed position in which the valve is open for flushing of the catheter at the flushing flow rate, the improvement comprising in combination the steps of:

making said operator of an elastic material providing an integral elastic sleeve about said end portion of the valve stem:

employing said integral elastic sleeve for biasing said operator to said rest position before and after manual actuation against the bias of said elastic sleeve to said depressed position; and

protecting said operator against accidental depression at all points thereof by completely surrounding said operator with a shield surpassing said operator around its entire circumference so as to require said human finger to penetrate into said shield for engagement of said operator prior to depression from said rest position against the bias of said elastic sleeve for an opening of said valve.

4,624,663

PINCH VALVE ASSEMBLY

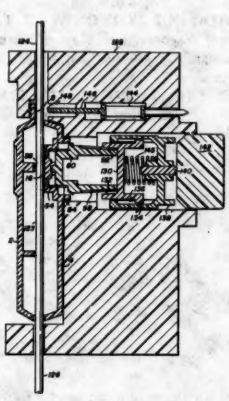
Hal C. Danby, Palo Alto, and Carl Ritson, San Jose, both of Calif., assignors to Critikon, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 493,182, May 10, 1983, Pat. No. 4,559,045. This application May 24, 1984, Ser. No. 613,557

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—250 **2 Claims**



1. A disposable pinch valve assembly for a parenteral solution delivery system comprising a tubing receptor housing having mutually engagable front and back sections, the front section including a stationary pressure plate means against which tubing can be pressed, a motor driven actuator means, the back section including a movable pressure plate means for pressing tubing against said stationary pressure plate means in response to forward axial displacement by the motor-driven actuator means in threaded engagement therewith, the actuator means having a non-binding forward rotational depth stop means for stopping forward advancement of the actuating means beyond a position which represents total closure of the flow passageway of tubing positioned in the assembly, the non-binding depth stop means comprising planar surfaces of a housing projection and an actuator means projection which are positioned to abut when the forward axial displacement of the motor-driven actuator means advances to the position which represents total closure of the flow passageway of tubing positioned in the assembly.

4,624,664

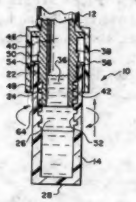
ANTIBACTERIAL CLOSURE SYSTEM

Francesco Peluso, Louvain, and Patrick Balteau, St. Geores sur Meuse, both of Belgium, assignors to Travenol European Research and Development Centre (TERADEC), Brussels, Belgium

Continuation of Ser. No. 757,586, Jul. 22, 1985, abandoned. This application Mar. 10, 1986, Ser. No. 838,875

Int. Cl.[4] A61M *25/00, 1/28*

U.S. Cl. 604—256 **6 Claims**



1. A closure system comprising

a connector including means for defining a luer fitment having an interior bore and wall means for defining a skirt peripherally surrounding said luer fitment,

a cap for joining to said connector, said cap having an exterior wall surface and an interior wall surface defining an interior chamber into which said luer fitment is advanced as said cap and connector are joined and in which a liquid antiseptic is retained, and

means associated with said cap and said connector forming a continuous first seal area between said exterior cap wall surface and said connector skirt and a continuous second seal area between said interior cap wall surface and said luer fitment for trapping the retained liquid antiseptic within said cap chamber as said cap and said connector are joined and for directing the liquid antiseptic from said cap chamber into said interior bore of said luer fitment as said luer fitment is advanced into said interior cap chamber.

4,624,665

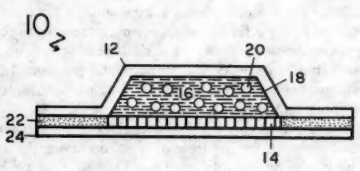
METHOD OF TRANSDERMAL DRUG DELIVERY

Elie S. Nuwayser, Wellesley, Mass., assignor to Biotek, Inc., Woburn, Mass.

Filed Oct. 1, 1984, Ser. No. 653,362

Int. Cl.[4] A61F *13/02*; A01N *25/26*; A61J *3/00*; A61K *9/70*

U.S. Cl. 604—307 **14 Claims**



1. A method for the accelerated sustained-release transdermal delivery of a drug to a user, which method comprises:

(a) preparing a composition which comprises:

(i) a viscous film-forming liquid base material selected to occlude the skin of the user and to force hydration of

the stratum corneum layer with water from the lower layers of the epidermis of the user in use; and

(ii) a plurality of solid microparticles generally uniformly dispersed and suspended in the liquid base material, the microparticles containing therein a drug for transdermal delivery to a user, the microparticles present in an amount to provide an effective therapeutic amount of the drug over a selected time period to the user in a predetermined sustained release pattern, the microparticles controlling the release pattern of the drug; and

(b) applying a thin coating layer of the composition to the skin of the user for transdermal delivery of the drug to the user.

4,624,666

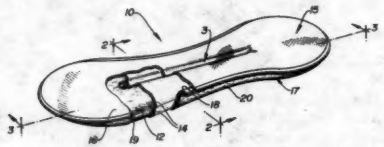
CHANNELED NAPKIN WITH DRY COVER

Edmund Z. DeRossett, Mercerville, and Frederick F. Gentzel, Ringoes, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Jul. 20, 1984, Ser. No. 632,754

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—366 **15 Claims**



1. A sanitary napkin comprising an elongated absorbent core having a body facing side and a garment facing side; said absorbent core having impressed into the body facing side at least one elongated channel having walls and a bottom; said napkin having a hydrophobic body fluid pervious cover comprising a continuous film of hydrophobic polymeric material rendered permeable to body fluid by being provided with apertures; said fluid pervious cover overlying said body facing side of said absorbent core including its impressed channel; said cover extending into said channel and being adhered to said channel bottom and unadhered to the remainder of said absorbent core.

4,624,667

ADDITIVE TRANSFER DEVICE

Sangvorn Rutnarak, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 11, 1984, Ser. No. 619,669

Int. Cl.[4] A61M *5/00*; A61J *1/08*

U.S. Cl. 604—414 **20 Claims**

1. An improved additive transfer device for storing and transferring a fluid material to a solution container having an exposed stooper, comprising:

an additive container for storing the fluid material, said additive container having a substantially rigid neck portion defining a finsh and an opening therethrough;

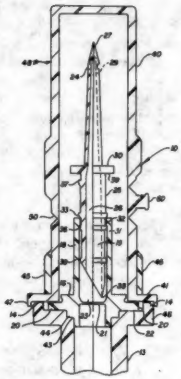
a pierceable stopper having a shoulder for resting against said finish of said container neck and positioned to close said opening in the additive container, said pierceable stopper including a guide channel;

a piercing pin having a point on each end, and a passageway therethrough for the flow of the fluid material said piercing pin being slidably positioned within said guide channel;

first and second resistance means comprising spaced-apart projections extending from said piercing pin and at least one annulus extending into said guide channel to position one of said piercing pin points away from said pierceable stopper in one position and to permit passage of said piercing pin point through said pierceable stopper in another position;

a hood member having a flange portion to sealably contact said shoulder of said pierceable stopper; and

sealing means positioned between said pierceable stopper and said container finish;



whereby a fluid pathway is provided between the containers to permit the fluid material within said additive container to be transferred onto the solution container when said piercing pin pierces said pierceable stopper.

4,624,668

METHOD FOR COTTONWOOL TAMPON

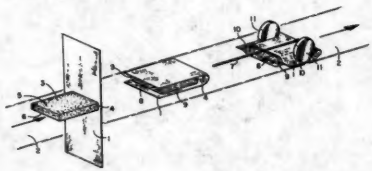
Hans P. Siegers, Wegberg, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 23, 1984, Ser. No. 573,082

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1983, 3302193

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—904 **14 Claims**



1. A method for the manufacture of a fluff-free cottonwool tampon having a section of cottonwool encased in a fluff-free covering material and a recovery cord associated therewith comprising:

(a) moving a section of cottonwool having at least a top, front edge, and bottom in a horizontal path;

(b) draping a sheet of fluff-free covering material, whose surface area is sufficient to cover the combined surface areas of the top, forward edge, and bottom of said section, directly in the path of said moving section, in a plane perpendicular to the direction of movement of said section;

(c) butting the forward edge of said section against the approximate center of said sheet;

(d) continuing the forward motion of said section until said sheet is wrapped around the top, forward edge, and bottom surfaces of said section and extends a substantially

uniform distance beyond each lateral edge of said section other than said forward edge;

(e) joining together by seamless attachment the pair of top and bottom covering material extensions present on each side edge of said section; and

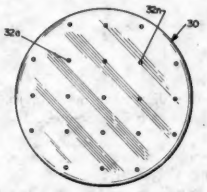
(f) attaching a recovery cord to the tampon by associating said cord with said tampon before said section has been encased by said sheet.

4,624,669

CORNEAL INLAY WITH HOLES

Dennis T. Grendahl, Orono, Minn., assignor to Surgidev Corporation, Santa Barbara, Calif.

Filed Sep. 26, 1984, Ser. No. 654,962
Int. Cl.[4] A61F *2/14*
U.S. Cl. 623—5 **6 Claims**



1. Corneal inlay comprising:

a. an optic lens of a material for implant within the cornea; and,

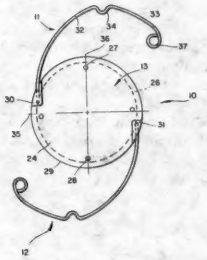
b. plurality of holes having a diameter from 0.001 mm to 0.1 mm extending from a bottom surface to a top surface for passage of nutrients through the cornea.

4,624,670

INTRAOCULAR LENS

Charles H. Bechert, II, 4875 NE. 20th Ter., Fort Lauderdale, Fla. 33308

Continuation-in-part of Ser. No. 483,384, Apr. 8, 1983, abandoned. This application May 17, 1984, Ser. No. 611,527
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 **16 Claims**



1. An intraocular lens for implantation within the eye, said lens comprising:

a lens body having a central axis and a back surface and a convex front surface; and

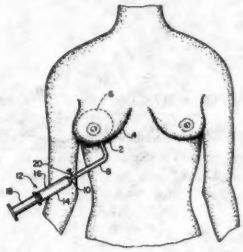
a pair of resilient filament members extending outwardly from said lens body at substantially diametrically opposed positions, each of said filament members having a proximal end at said lens body and a distal end spaced apart from said lens body, each filament member including an inward niche having a depth greater than the thickness of the filament member and located intermediate the proximal and distal ends, each of said filament members projecting from said lens body in curves having a first part and a second part, the first part extending at a progressively increasing radial distance from said axis of said lens body, the second part extending generally concentrically with said lens body, the filament members being shaped and the niches located to provide four point fixation of the lens in the confinement tissue of the eye.

4,624,671

METHOD OF SIZING AND IMPLANTING BREAST PROSTHESIS

Donald W. Kress, 27 Forest Rd., Wheeling, W. Va. 26003

Filed Jun. 25, 1984, Ser. No. 624,354
Int. Cl.[4] A61F *2/12*; G01F *17/00*
U.S. Cl. 623—8 **25 Claims**



1. A method of sizing a breast prosthesis comprising the steps of

(a) implanting an empty, inflatable elastomeric balloon in a breast;

(b) filling the balloon with a liquid to a desired size;

(c) measuring the amount of liquid in the filled balloon;

(d) removing the liquid from the balloon; and

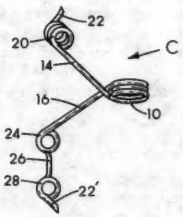
(e) removing the empty balloon from the breast.

4,624,672

COILED WIRE PROSTHESIS FOR COMPLETE OR PARTIAL OSSICULAR RECONSTRUCTION

Edmundas Lenkauskas, 3024 Kersdale Rd., Pepper Pike, Ohio 44124

Filed Mar. 15, 1984, Ser. No. 589,709
Int. Cl.[4] A61F *2/18*
U.S. Cl. 623—10 **19 Claims**



1. A prosthesis for conducting sound between the tympanic membrane and the inner ear comprising:

an upper arm having a head ring with a sharp point at one end for connecting the upper arm to the tympanic membrane to allow sound vibrations to be conducted from the tympanic membrane through the upper arm;

a spring coil assembly located at an end of said upper arm opposite the head ring end to facilitate spring action and to conduct sound therealong; and

a lower arm having one end connected to said spring coil

assembly and a second end for conducting sound from said spring coil assembly to the inner ear.

4,624,673

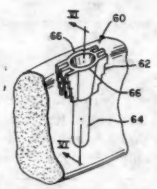
DEVICE SYSTEM FOR DENTAL PROSTHESIS FIXATION TO BONE

Benjamin S. Meyer, Birmingham, Ala., assignor to United States Medical Corporation, Washington, D.C.

Continuation-in-part of Ser. No. 341,224, Jan. 21, 1982, abandoned. This application Aug. 3, 1982, Ser. No. 404,874

Int. Cl.⁴ A61F *2/28*

U.S. Cl. 623—16 **11 Claims**



1. A component for use in a prosthetic joint comprising a hollow tubular means which has a closed end and an open end, the portion of said tubular means which is adjacent the open end having external features which increase its surface area to at least twice the surface area of the portion adjacent the closed end and the inner surface of said portion adjacent the open end defining a female part of self-locking taper; and elongated pin means having a first section which is adjacent to one end of said pin means defining a male cone of self-locking taper which is received in said female part and coacts therewith and a second section which is adjacent the other end of said pin means which projects from the open end of said hollow tubular means to serve as a support for a joint motion surface.

4,624,674

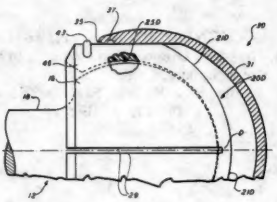
SPHERICAL KINEMATIC JOINT

Michael J. Pappas, 61 Gould Pl., Caldwell, N.J. 07006, and Frederick F. Buechel, 76 Crest Dr., South Orange, N.J. 07079

Division of Ser. No. 351,760, Feb. 24, 1982. This application Oct. 1, 1984, Ser. No. 656,507

Int. Cl.⁴ A61F *1/04*

U.S. Cl. 623—22 **18 Claims**



1. An improved spherical prosthetic joint for providing three degrees of rotational movement between two bones comprising:

(a) a first component for engaging one of two said bones and providing internally a first seat;

(b) a second component for engaging the other of said two bones and including a neck and a spherical head;

(c) a substantially cup shaped bearing insert having a central axis comprising:

(i) a pair of opposed and substantially distinct clam shell-shaped bearing members separated by a plane of separation aligned substantially along said central axis and providing internally a second seat having an opening, said second seat for receiving said head and said clam shell-shaped bearing members having rearward portions,

(ii) a hinge provided at said rearward portions about which hinge said clam shell-shaped bearing members pivot outwardly and expand to permit said head to be received into said second seat;

(d) said bearing insert and said first component provided with cooperative retaining means for retaining said bearing insert within said first seat upon insertion of said bearing insert into said first component; and

(e) upon said head being received within said second seat with said neck extending through said opening, said bearing insert for being received and retained within said first seat with said first component constraining said bearing members against pivoting outwardly thereby confining said head within said second seat whereby said rotational movement between said two bones is permitted, said bearing insert providing an overlap angle for preventing dislocation of said head from said bearing insert during said rotational movement.

4,624,675

WOVEN COTTON FABRIC AND ITS PREPARATION

Siegfried Irmer, Reutlingen, Fed. Rep. of Germany, assignor to Möve-Werk GmbH & Co. KG, Reutlingen, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 762,059

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508386; Mar. 25, 1985, 3510730

Int. Cl.[4] D06L *3/02*

U.S. Cl. 8—115.6 21 Claims

1. In a process for producing woven cotton fabric having a main warp and a weft, the improvement which comprises:

wetting the main warp with water-soluble cold size, at warping, before weaving;

washing out the size with soda and a decalcifying agent, after weaving;

washing the resulting fabric with warm clean water;

rinsing the thus-washed fabric; and

drying the rinsed fabric on a tenter frame; whereby treated cotton warp fibers comprise an interior hollow space, a corkscrew twist, and a wax-like coating similar to untreated cotton fibers, and said fibers are substantially free from chemical residue.

4,624,676

ORGANOSILOXANE POLYMERS FOR TREATMENT OF FIBRES THEREWITH

James W. White; Stephen Westall, both of Barry, and Brian J. Griffiths, Coytrahen, all of Wales, assignors to Dow Corning, Ltd., Barry, Wales

Division of Ser. No. 546,793, Oct. 31, 1983, Pat. No. 4,599,438. This application Dec. 27, 1985, Ser. No. 813,807

Claims priority, application United Kingdom, Nov. 16, 1982, 8232646

Int. Cl.[4] D06M *15/00*

U.S. Cl. 8—115.56 4 Claims

1. A process for the treatment of textile fibers which consists essentially of applying to said textile fibers an organosiloxane represented by the general formula:

$$[R'R_2SiO_{0.5}]_2[R''(CH_3)SiO]_a[R_2SiO]_b[(HOOCQ)\overset{R}{\underset{|}{Si}}O]_c$$

wherein Q represents a divalent group attached to silicon through a silicon to carbon bond and selected from hydrocarbon groups, groups composed of carbon, hydrogen and oxygen and groups composed of carbon, hydrogen and sulphur, each R represents a monovalent hydrocarbon group having less than 19 carbon atoms, at least 50 percent of the total R groups being methyl, each R′ represents a hydrogen atom, an alkoxy or alkoxyalkoxy group having less than 7 carbon atoms, a monovalent hydrocarbon group having less than 19 carbon atoms or the group —QCOOH, except that R′ may not represent a monovalent hydrocarbon group or the group —QCOOH when a is 0, R″ represents a hydrogen atom or an alkoxy or alkoxyalkoxy group having less than 7 carbon atoms, a is 0 or an integer, b is 0 or an integer and c is an integer having a value up to

$$\frac{a+b+c+2}{3},$$

there being present in the molecule at least two silicon-bonded substituents selected from the hydrogen atom, alkoxy groups having less than 7 carbon atoms and alkoxyalkoxy groups having less than 7 carbon atoms.

4,624,677

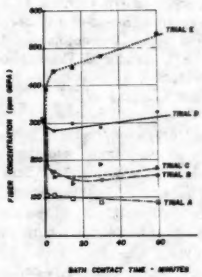
METHOD FOR CONTROLLING ANTIMICROBIAL CONTENT OF FIBERS

Lawrence J. Guilbault; Thomas C. McEntee, both of Topsfield, and Judith L. Koob, Danvers, all of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Oct. 3, 1984, Ser. No. 657,119

Int. Cl.[4] D06P *5/00;* B32B *9/00;* D02G *3/00*

U.S. Cl. 8—490 26 Claims



1. A method for obtaining a desired antimicrobial agent concentration in a fiber while passing said fiber through a liquid medium, comprising:

providing a fiber containing an initial concentration of antimicrobial agent that is essentially homogenously distributed throughout the fiber cross-section;

passing said fiber through a liquid medium which contains the same antimicrobial agent that is contained in said fiber, said antimicrobial agent in said liquid medium being controlled in a concentration relative to the initial concentration in said fiber whereby a desired, predetermined antimicrobial concentration in said fiber following its passage through said liquid medium is obtained.

4,624,678

PROCESS FOR THE PREPARATION OF GRANULAR DYE FORMULATIONS

Dieter Schneider, Grenzach-Wyhlen, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,356

Claims priority, application Switzerland, May 4, 1984, 2188/84

Int. Cl.[4] C09B *67/02*

U.S. Cl. 8—526 9 Claims

1. A process for the preparation of a granular dye formulation which comprises:

a. suspending or dissolving a dye in water,

b. adding to the product of step (a) a polyethylene glycol that melts in the range of from 40° C. to 150° C., and

c. forming granules from the product of step (b) by spray or fluidized bed drying.

4,624,679

COMPOSITIONS CONTAINING ANTIMICORBIAL AGENTS IN COMBINATION WITH STABILIZERS

Thomas C. McEntee, Topsfield, Mass., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Jan. 3, 1985, Ser. No. 688,490

Int. Cl.[4] C09B *67/00;* C08K *5/13, 5/59;* A01N *11/02*

U.S. Cl. 8—650 64 Claims

1. A thermoplastic composition which will be resistant to microbial attack after being processed at an elevated temperature, comprising a homogeneous mixture of:

A. a polyamide resin;

B. an antimicrobial agent; and

C. an amount of an antioxidant effective to reduce degradation of said antimicrobial agent while said composition is being melt-processed.

4,624,680

COAL-WATER SLURRY AND METHOD FOR ITS PREPARATION

James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation, Inc., Alfred, N.Y.

Continuation of Ser. No. 88,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application Jun. 10, 1981, Ser. No. 270,853

Int. Cl.⁴ C10L *1/32*

U.S. Cl. 44—51 **49 Claims**

1. A stabilized coal slurry comprising pulverized and purified coal, water and a dispersing agent, said dispersing agent by selective absorption having produced different charging of particles of coal and particles of other substances to obtain purified coal and maintain the stability of the slurry.

2. Composition as claimed in claim 1, wherein the dispersing agent is a polyelectrolyte.

3. Composition as claimed in claim 1, wherein the particle size of the pulverized carbon is less than 30 microns.

4,624,681

DISPERSANT ADDITIVES FOR LUBRICATING OILS AND FUELS

Robert H. Wollenberg, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 643,217, Aug. 22, 1984, Pat. No. 4,584,117. This application Feb. 28, 1986, Ser. No. 835,130

Int. Cl.⁴ C10L *1/22*

U.S. Cl. 44—63 **19 Claims**

1. A fuel composition comprising a hydrocarbon boiling in the gasoline or diesel range and from 10 to 10,000 parts per million of a product prepared by the process which comprises (a) first reacting a polyamine with a cyclic carbonate at a temperature sufficient to cause reaction wherein the molar charge of said cyclic carbonate to the basic amine nitrogen of said polyamine is from about 0.1:1 to about 10:1; (b) contacting at a temperature sufficient to cause reaction the product of (a) above with an alkenyl or alkyl succinic anhydride wherein the molar charge of said alkenyl or alkyl succinic anhydride to said product of (a) above is from about 0.5:1 to about 5:1.

4,624,682

MOTOR FUEL DETERGENT ADDITIVES

Rodney L. Sung, Fishkill, and Benjamin J. Kaufman, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 821,713, Jan. 23, 1986. This application Mar. 28, 1986, Ser. No. 845,720

Int. Cl.⁴ C10L *1/22*

U.S. Cl. 44—71 **13 Claims**

1. A motor fuel composition comprising

(a) a major portion of a fuel containing a hydrocarbon boiling in the gasoline boiling range; and

(b) a minor effective amount of, as a detergent additive, an amide reaction product derived from the reaction of an amine and a bicyclic keto-acid.

2. The motor fuel composition of claim 1, wherein said amine is a diamine having the structure:

$$R'—NH—R''—NH_2$$

where R′ is a (C_{12}–C_{18}) hydrocarbon group and R″ is a (C_1–C_3) hydrocarbon group.

4,624,683

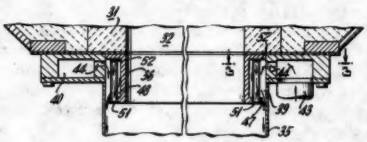
QUENCH RING AND DIP TUBE COMBINATION WITH IMPROVEMENT

Michael M. Dach, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 20, 1985, Ser. No. 736,886

Int. Cl.⁴ C10J *3/72*

U.S. Cl. 48—69 **5 Claims**



1. In a refractory lined, gasification reactor chamber (31) having discharge means for a hot product gas from an outlet (32) in the gasification reactor bottom,

an elongated dip tube (35) depending from said reactor bottom having an inner wall which defines a central effluent passage for conducting said gaseous effluent from said outlet (32),

an annular quench ring (36) registered in said dip tube (35) central effluent passage, defining an annular conduit (39) intermediate said dip tube inner wall and said quench ring (36),

coolant conducting means in fluid communication with a water supply, and forming an annular chamber (40) positioned adjacent to said annular conduit (39), and having at least one passage thereinbetween to deliver a stream of water thereto, wherein the improvement comprises

at least one perforated wall standpipe (48) extending between the top of said annular conduit (39), and opening into said central effluent passage,

whereby, hot gaseous effluent and water which enter said annular conduit (39) will be conducted by said at least one perforated wall standpipe (48) into said central effluent passage.

4,624,684

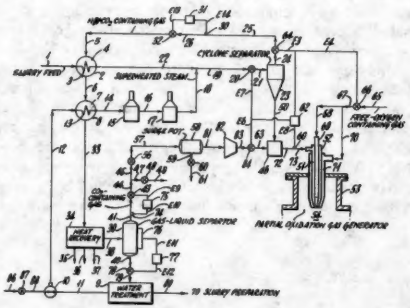
PROCESS FOR FEEDING AND GASIFYING SOLID CARBONACEOUS FUEL

John S. Stevenson, Gardena, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 3, 1985, Ser. No. 772,098

Int. Cl.⁴ C10J *3/46*

U.S. Cl. 48—197 R **24 Claims**



1. A process for the production of a stream of mixed gases comprising H_2 and CO comprising:

(1) heating an aqueous slurry of particulate solid carbonaceous fuel to a temperature in the range of about 200 to

650° F. in a first indirect heat exchange zone by noncontact heat exchange with a stream of skimmed gases from (3) to produce a preheated aqueous slurry stream and a separate partially cooled stream of skimmed gases;

(2) mixing the prehated aqueous slurry from (1) in a mixing zone with a separate stream of superheated steam, thereby vaporizing the water in the slurry and producing a suspension of particulate solid carbonaceous fuel entrained in a gaseous mixture comprising steam and carbon dioxide, at a temperature of at least 400° F.;

(3) separating from about 10 to 99 wt. % of the gaseous mixture from said suspension in (2) in a cyclone separating zone to produce an overhead stream of skimmed gases comprising steam and carbon dioxide, and a bottom stream comprising a mixture of particulate solid carbonaceous fuel and the remainder of said gaseous mixture;

(4) cooling said partially cooled stream of skimmed gases from (1) and condensing H_2O;

(5) purifying water that was condensed from the stream of skimmed gases to produce a stream of purified water and a separate stream of residual waste water;

(6) introducing said bottom stream from (3) by way of a burner into the reaction zone of a free-flow partial oxidation gas generator where in admixture with a free-oxygen containing gas and with or without additional temperature moderator, reaction takes place for the production of a hot raw product gas stream comprising H_2 and CO;

(7) mixing at least a portion of the residual waste water from (5) with particulate solid carbonaceous fuel to produce at least a portion of said aqueous slurry in (1); and

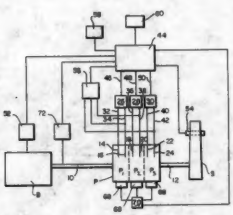
(8) converting said purified water from (5) into at least a portion of said superheated steam used in (2).

4,624,685

METHOD AND APPARATUS FOR OPTIMIZING POWER CONSUMPTION IN AN ELECTROSTATIC PRECIPITATOR

Donald L. Lueckenotte, Blue Springs, Mo., and Robert P. Kaltenbach, Mission, Kans., assignors to Burns & McDonnell Engineering Co., Inc., Kansas City, Mo.

Filed Jan. 4, 1985, Ser. No. 688,962
Int. Cl.[4] B03C *3/00*
U.S. Cl. 55—13 **40 Claims**



1. A process for optimizing the power comsumption of an electrostatic precipitator communicating with a boiler comprising the steps of:

(a) providing a controller regulating field power of a precipitator;

(b) establishing a particulate offset and an environmental limit for particulates and feeding same to said controller;

(c) generating a signal indicative of a boiler load and feeding said signal forward to said controller for regulating the field power of the precipitator;

(d) generating another signal indicative of a particulate loading of a flue gas exiting the precipitator and feeding said another signal back to said controller;

(e) establisning a setpoint defined by the lesser of said environmental limit for particulates and a sum of said particulate offset and a stored particulate limit; and,

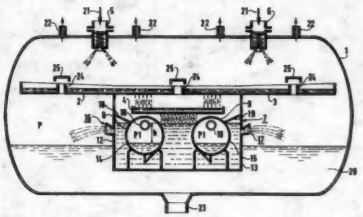
(f) comparing said another signal with the setpoint and causing said controller to incrementally trim the field power by decreasing the field power and replacing said particulate limit with said another signal when said another signal is less than the setpoint and increasing the field power when said another signal exceeds the setpoint.

4,624,686

APPARATUS FOR DEGASSING A LIQUID FLUID

Bernard Andrieux; Elisabeth Bourven, both of Boulogne Billancourt, and Roger Martin, Fresnes, all of France, assignors to Delas-Weir, Levallois Perret, France

Filed Nov. 20, 1985, Ser. No. 799,995
Claims priority, application France, Nov. 20, 1984, 84 17656
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—196 **7 Claims**



1. In an apparatus for degassing a liquid fluid installable in an envelope which contains a supply of said degassed fluid in a liquid state in the bottom thereof and in equilibrium with its saturated vapor, said apparatus comprising;

a tank,

perforated trays mounted on said tank and for being situated above the level of said supply and for being fed with liquid fluid to be degassed, said trays dispersing the liquid and feeding said tank, said tank including at least one pipe extending therealong in the vicinity of one of its walls and for being supplied with vapor of said fluid at a pressure P1 which is greater than the pressure P within said envelope, said pipe including a perforated zone running along its entire length inside the tank and on its side adjacent to said wall, said perforated zone serving to fill the bottom portion of the pipe cross-section with liquid from the tank and allowing the vapor to escape from said pipe, the improvement whereby the top of said tank is closed between said wall and said pipe, and said wall is provided with at least one spray nozzle along its entire length level with the pipe and above said perforated zone of the pipe.

4,624,687

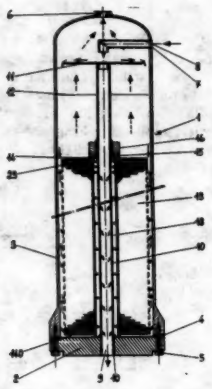
DEGASIFIER

Gérard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France

Filed Dec. 21, 1984, Ser. No. 685,181
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—206 **10 Claims**

1. A degasifier for an electrolysis plant, of the type comprising a dismountable container (1) provided with at least one inlet (7) for the elecrolytic liquid charged with gas, at least one outlet (9) for the degasified liquid, and at least one outlet (6) for the gas extracted, said container holding, set back relative to its inner wall, at least one stack (13) of plates (14) arranged in such a manner as to form superposed compartments (23), each stack being immersed in the electrolytic liquid and each compartment being provided with at least one upstream inlet aperture (24) for liquid charged with gas, and at least one downstream outlet aperture (22) for degasified liquid, wherein said stack is composed, after the style of a pile of dishes, of separable plates placed one on the other, each plate (14) being provided with a

central hole (17), so that the stack, once formed, has a vertical passage (18) passing axially through it from top to bottom, and each plate (14) being in addition provided with respective outer (19) and inner (20) rims forming for each compartment (23) at least one peripheral opening (24) to the outside and at



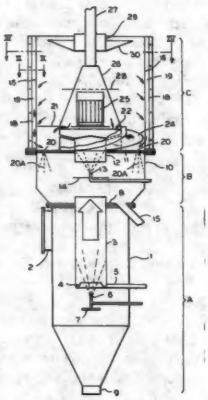
least one central opening (22) into said passage, while the degasifier is equipped with means for circulating the electrolytic liquid, in each compartment (23), between at least one peripheral opening (24) and at least one central opening (22), or vice versa.

4,624,688

DEVICE FOR THE PURIFICATION OF GASES

Markku T. Vatunen, Kerava, Finland, assignor to Oy A W Enbom AB, Derava, Finland

Filed Nov. 23, 1984, Ser. No. 674,277
Claims priority, application Finland, Nov. 29, 1983, 834370
Int. Cl.[4] B01D *47/06, 47/12*
U.S. Cl. 55—238 **10 Claims**



1. A device for the purification of gases comprising, in combination:

a first cylindrical vessel defining a cyclone that provides a pre-purification section, a tangential gas inlet pipe for admitting gas to be purified into said cyclone, an upright central rising pipe on the vertical axis of the cyclone that has an open lower end into which gas flows, and an open upper end, first means for directing a liquid spray upwardly into the open lower end of the rising pipe, a liquid outlet at the lower end of the cyclone, and a first annular partition near the upper end of the rising pipe that defines the top of the cyclone;

a second cylindrical vessel defining a pre-scrubbing section surmounting said first annular partition, the open upper end of the rising pipe discharging gas into a lower portion of said prescrubbing section, an upright central connecting pipe that has an open lower end toward the top of said prescrubbing section axially aligned with said rising pipe, said connecting pipe having an upper end, a liquid discharge at the bottom of said prescrubbing section, and a second annular partition that surrounds the connecting pipe and defines the top of the prescrubbing section;

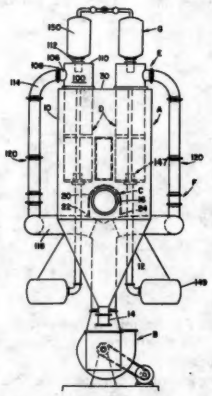
and a third cylindrical vessel defining a centrifuge section surmounting said second annular partition, a centrifugal blower casing that has a lateral outlet, a driven impeller in said casing that is immediately adjacent to and axially aligned with the open upper end of the connecting pipe, a spirally rising baffle in said centrifuge section, said baffle having a lower end operatively associated with said blower casing outlet, second means for directing a liquid spray upwardly through the connecting pipe into the blower casing, a purified gas outlet pipe at the upper end of the centrifuge section, and means for discharging liquid from the bottom of the centrifuge section.

4,624,689

PNEUMATIC SHOCK WAVE GENERATOR FOR CLEANING FILTER CARTRIDGES

Michael Volk; David A. Metzger, both of Mansfield, Ohio; Donald H. Ostby, and Robert R. Ostby, both of Muskegon, Mich., assignors to Mike Volk Co., Inc., Mansfield, Ohio

Division of Ser. No. 345,623, Feb. 4, 1982, Pat. No. 4,445,912.
This application Feb. 6, 1984, Ser. No. 577,235
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—269 **21 Claims**



1. A filtration system comprising:

an enclosed housing having an inlet in an upper housing region for receiving air to be filtered, a lower collection region disposed below the upper housing region for accumulating particles filtered from the received air, the upper region having at least one outlet receiving a first filter cartridge therein;

a plenum means operatively connected with the filter cartridge through the outlet for receiving filtered air therethrough and for discharging the filtered air; and,

a shock wave generator including:

a pressure reservoir holding a supply of gas under pressure which gas is received from a source of the gas under pressure,

a valve seat supported by the plenum means in fluid communication with the pressure reservoir and with the filter cartridge,

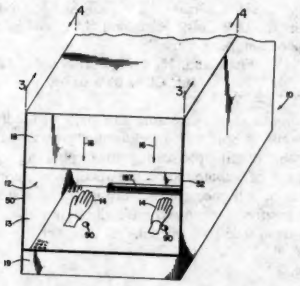
a movable valving element which is selectively movable into and out of engagement with the valve seat, a tubular valve side wall in which the movable element is slidably disposed, the tubular valve side wall being operatively connected with the valve seat and defining ports adjacent the valve seat, and the tubular valve side wall defining an upper valve portion on one side of the movable element opposite the valve seat, the upper valve portion being connected with the gas source in such a manner that the gas pressure in the upper valve portion biases the movable element toward the valve seat, the valve ports being disposed in fluid communication between the pressure reservoir and the valve seat such that the movable element selectively blocks gas from flowing from the reservoir through the valve seat, and

a means for selectively venting the upper valve portion to atmosphere to unseat the valving element from the valve seat and permit gas to flow from the reservoir through the valve ports and the valve seat into the filter cartridge.

4,624,690
APPARATUS FOR REMOVING PARTICULATES

John Byrnes, Lebanon, Conn., assignor to Markel Industries, Inc., Enfield, Conn.

Filed Jun. 28, 1985, Ser. No. 750,335
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—385 R **43 Claims**



1. An apparatus for removing particulates from an object, said apparatus comprising:

means defining a cleaning chamber for receiving an object and having a constantly open opening allowing an object to be moved at all times freely between said chamber and the external environment surrounding said chamber,

means for developing a first stream of air within said cleaning chamber to remove particulates from an object when received within said cleaning chamber,

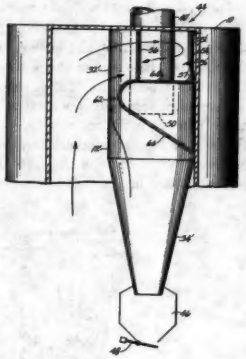
means for developing a curtain of air within said chamber which curtain of air is located adjacent said opening and flows across said opening generally in a plane parallel to said opening to cover said opening and to thereby inhibit particulates removed from an object by said first stream from escaping from said cleaning chamber through said opening, and

means for recirculating the air of said curtain and the air of said first stream.

4,624,691
CYCLONE SEPARATORS TO PREVENT OR REDUCE CLOGGING

Horst W. Schneider, Covina, Calif., assignor to Varnas Enterprises, Monrovia, Calif.

Filed Mar. 4, 1985, Ser. No. 707,674
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—396 **7 Claims**



1. A separator for removing particulates from a gas stream comprising:

a cylindrical enclosure to receive gas streams;

a cylindrical cyclone disposed within the enclosure, the cyclone having an inlet opening with upper and lower bounds, one side boundary adjacent the inner wall of the enclosure and the other side boundary spaced from the inner wall to define a scroll-shaped passage, the cyclone further including an axially arranged outlet tube and defining an annular swirl chamber within the cyclone about the outlet tube, said cyclone further including a flow directing surface disposed in the swirl chamber and defining the inlet opening upper bound, the flow directing surface having a first horizontal portion to direct the gas stream in a horizontal plane, a ramp portion to direct and accelerate the gas stream downwardly at an oblique angle with respect to said first portion and a second horizontal portion to re-direct the gas stream into a horizontal plane; and

a flow controlling surface extending between the inner wall and the cyclone from the inlet opening to a leading edge, the surface being contoured to accelerate the gas stream as it flows to the inlet opening, the stream entering the cyclone to flow in a vortex fashion to separate the particulates, the particulate free gas being discharged from the outlet.

4,624,692
APPARATUS FOR THE CONTINUOUS PRODUCTION OF OPTICAL FIBRES

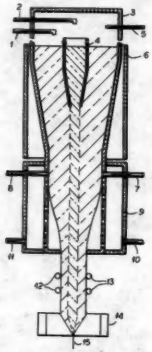
Giacomo Roba, Via dei pini domestici 5, Cogoleto (Genova), Italy, assignor to Cselt-Centro Studi Laboratori Telecomunicazioni SpA, Turin, Italy

Filed Dec. 5, 1985, Ser. No. 805,848
Claims priority, application Italy, Dec. 18, 1984, 68255 A/84
Int. Cl.[4] C03B *37/023*
U.S. Cl. 65—1 **4 Claims**

1. An apparatus for the continuous production of optical fibres, in which the materials forming the preform and the dopants for the refractive-index variation are derived from the reaction among liquid reactants, and optical fibres are obtained by drawing the preform heated up to the softening point, characterized in that it comprises:

a first vertical vessel (3), having the shape of a frustum of cone with the minor base facing the bottom, and hermetically sealed in correspondence with the upper part whereto said liquid reactants are injected through first (1) and second (2) conduits and a pressurization gas through third conduits (5), in the middle of said first vessel being placed fourth conduits (7,8) for sucking residual reaction vapours and drying gases, the lateral surface comprised between the fourth conduits and the minor base being made of porous material for the immission of drying gases and the minor base having an axial hole through which the consolidated vitreous material goes downwards;

a second vessel (4), having the shape of a frustum of cone with the minor base facing the bottom and coaxial with said first vessel, whereby it is housed and wherethrough it can translate in vertical direction, the upper base allowing the injection of liquid reactants through a suitable inlet and the lower base allowing the flow downwards of the partly-consolidated material the optical-fibre core is made of;



a first furnace, (6) coaxial with the first vessel (3) and extending from the upper part to the middle of said first vessel, its temperature increasing from top to bottom from room-temperature to the temperature apt both to produce the reaction among the liquid reactants and to obtain solid partly consolidated material;

a second furnace, (9) coaxial with the first vessel (3) and extending from the middle to the bottom of said first vessel, which it closes hermetically in order to allow the injection of drying gases through said porous material of the lateral surface and fifth conduits (10,11), its temperature increasing from top to bottom till it reaches the vitrification temperature of the material for optical-fibre production;

said first conduits (1) being arranged so that the liquid reactants, apt to produce material for the fibre-cladding fabrication, are poured into the first vessel (3);

said second conduits (2) being arranged so that liquid reactants, apt to produce the material for the fibre-core fabrication, are poured into the second vessel (4).

4,624,693

METHOD AND APPARATUS FOR FORMING GLASS FIBERS

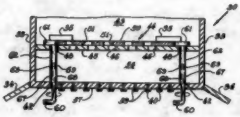
Jerome F. Marra, Granville, and William M. Babbitt, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 17, 1985, Ser. No. 809,961
Int. Cl.[4] C03B *37/09*
U.S. Cl. 65—1 **14 Claims**

1. A feeder means for supplying streams of molten glass from a body of molten glass to be attenuated into filaments comprising:

a discharge wall having a plurality of orifices adapted to issue the molten glass as said streams;

a first plate positioned in the body of molten glass having a plurality of apertures therethrough dividing the feeder into a first zone upstream of said plate and a second zone between said plate and said discharge wall; and



a second plate in movable, abutting engagement with the first plate, the second plate having a plurality of ports therethrough positioned to variably align with the apertures of the first plate to cooperate therewith to selectively control the resistance to glass flow therethrough such that the feeder (1) operates in a dripless manner during filament production and (2) operates in a non-dripless manner to facilitate the re-start of the flow of molten glass from said orifices.

4,624,694

SEED TREATMENT METHOD WITH AQUEOUS SUSPENSION OF ALKALI LIGNIN

Humbert T. DelliColli, Hanahan, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,405
Int. Cl.[4] A01N *65/00*
U.S. Cl. 71—77 **7 Claims**

1. A method of increasing the yield of seedlings emerging from seeds in soil and accelerating growth of the seedlings comprising coating the seeds prior to planting with an aqueous suspension of a water-insoluble alkali lignin containing minor amounts of a humectant, a wetting agent, a dispersing agent and an antifreeze agent wherein the lignin has a mean particle size of from 0.05 to 5 microns in diameter.

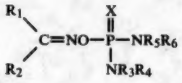
4,624,695

O-DIAMINOPHOSPHINYL DERIVATIVES OF OXIMES AS UREASE INHIBITORS

Michael D. Swerdloff, Parsippany; Milorad M. Rogic, Whippany, both of N.J., and Larry L. Hendrickson, Camillus, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J., '

Filed Dec. 20, 1983, Ser. No. 563,348
Int. Cl.[4] A01N *57/26;* A61K *31/66;* C07F *9/02*
U.S. Cl. 71—86 **31 Claims**

20. A fertilizer composition which comprises urea and/or one or more urea precursor compounds capable of forming urea in situ when subjected to the use conditions of the composition, and a urease inhibiting effective amount of one or more compounds of the formula:



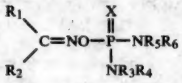
wherein:

X is oxygen or sulfur;

R_1 and R_2 are the same or different and are hydrogen, substituted or unsubstituted alkyl or aryl groups or R_1 and R_2 together may form a substituted or unsubstituted divalent aliphatic chain completing a cycloaliphatic group, which may optionally include one or more divalent heteroatoms of oxygen, sulfur or nitrogen wherein permissible substituents include one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkyl, carboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, O-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl; and

R_3, R_4, R_5 and R_6 are the same or different and are hydrogen or alkyl having from about 1 to about 4 carbon atoms.

31. A compound of the formula:



wherein:

X is oxygen or sulfur;

R_1 and R_2 are the same or different and are hydrogen, substituted or unsubstituted alkyl or aryl groups or R_1 and R_2 together may form a substituted or unsubstituted divalent aliphatic chain completing a cycloaliphatic group, which may optionally include one or more divalent heteroatoms of oxygen, sulfur or nitrogen wherein permissible substituents include one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkyl, carboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, O-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl; and

R_3, R_4, R_5 and R_6 are the same or different and are hydrogen or alkyl having from about 1 to about 4 carbon atoms.

4,624,696

CYCLOHEXENONE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Michael Keil, Freinsheim; Rainer Becker, Bad Durkheim; Dieter Jahn, Edingen-Neckarhausen; Dieter Kolassa, Ludwigshafen; Ulrich Schirmer, Heidelberg; Wolfgang Will, Mannheim; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

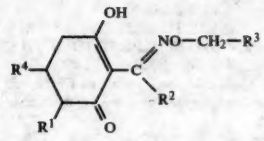
Filed Oct. 9, 1985, Ser. No. 785,756

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437238

Int. Cl.[4] **A01N** *43/08, 43/10;* **C07D** *307/54, 333/22*

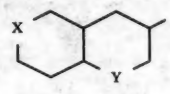
U.S. Cl. 71—88 **10 Claims**

1. A cyclohexenone derivative of the formula



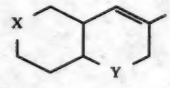
(I)

where R^1 is hydrogen or alkoxycarbonyl of 2 to 5 carbon atoms, R^2 is alkyl of 1 to 4 carbon atoms, R^3 is a 5-membered heterocyclic structure which contains 1 to 3 heteroatoms from the group consisting of N, O and S, with the exception of heterocyclic structures which possess more than two oxygen atoms or more than one sulfur atom in the ring, and may contain 1 to 2 double bonds and 1 or 2 substituents from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, trifluoromethyl, C_1–C_4-alkoxymethyl, C_1–C_4-alkylthiomethyl, vinyl and phenyl, and R^4 is a 5-membered to 7-membered heterocyclic structure which contains one or two identical or different heteroatoms as ring members, from the group consisting of N, O, S, SO and SO_2, may contain 1, 2 or 3 double bonds and is unsubstituted or substituted by not more than 2 alkyl, or alkoxy groups, each of 1 to 4 carbon atoms, or is a radical of the formula II



(II)

or IIa



(IIa)

where X and Y are each N, O, S, SO or SO_2, or a salt thereof.

10. A process for combatting unwanted plant growth, wherein the unwanted plants and/or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of a cyclohexenone derivative of the formula I as set forth in claim **1**, or a salt thereof.

4,624,697

DERIVATIVES OF TETRAHYDROBENZOTHIAZOLE AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME AS AN ACTIVE INGREDIENT

Katsumichi Aoki; Takafumi Shida; Hideo Arabori; Satoru Kumazawa; Susumu Shimizu; Takeo Watanabe; Yohichi Kanda; Keigo Satake; Shiro Yamazaki; Hiroyasu Shinkawa, and Tsuneaki Chida, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

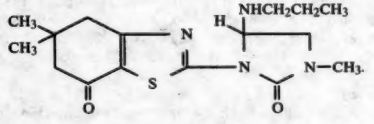
Filed Apr. 6, 1984, Ser. No. 597,451

Claims priority, application Japan, Apr. 8, 1983, 58-61924

Int. Cl.[4] **C07D** *417/04;* **A01N** *43/78, 43/82*

U.S. Cl. 71—90 **8 Claims**

4. 3-(4,5,6,7-tetrahydro-5,5-dimethyl-7-oxo-2-benzothiazolyl)-1-methyl-4-propylamino-2-imidazolidinone represented by the formula:



4,624,698

HERBICIDAL TETRAHYDROBENZOTHIAZOLYL-1,3,5-TRIAZINONE DERIVATIVES AND COMPOSITIONS THEREOF

Katsumichi Aoki; Takafumi Shida; Youichi Kanda; Keigo Satake; Shiro Yamazaki, and Tsuneaki Chida, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,178

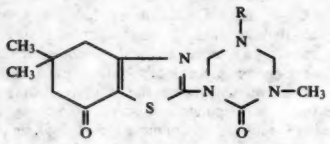
Claims priority, application Japan, Feb. 3, 1984, 59-19121

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.[4] A01N *43/78, 43/64;* C07D *417/04, 413/04*

U.S. Cl. 71—90 8 Claims

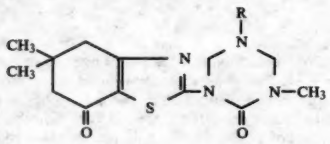
1. A compound represented by the formula(I):



(I)

wherein R represents a chemical group selected from the group consisting of 1-phenylethyl, allyl, 2-propynyl, cyclopropyl, cyclopentyl, phenyl, ethoxycarbonylmethyl, 2-tetrahydrofurylmethyl, 2-acetoxyethyl, 2-chloroethyl, 2-cyanoethyl, 2-hydroxyethyl, 2-methoxyethyl, 2,2-dimethoxyethyl, 2-(propionyloxy)ethyl, 2-(ethoxycarbonyl)ethyl, 2-(4-chlorobenzoyloxy)ethyl, 1-(hydroxymethyl)propyl, 3-hydroxypropyl, 3-methoxypropyl, 3-acetoxypropyl, 3-morpholinopropyl and 3-(2-methylpiperidino)propyl.

5. A herbicidal composition comprising, as an active ingredient thereof, a herbicidally effective amount of at least one of the compounds represented by the formula(I):



(I)

wherein R is a chemical group selected from the group consisting of 1-phenylethyl, allyl, 2-propynyl, cyclopropyl, cyclopentyl, phenyl, ethoxycarbonylmethyl, 2-tetrahydrofurylmethyl, 2-acetoxyethyl, 2-chloroethyl, 2-cyanoethyl, 2-hydroxyethyl, 2-methoxyethyl, 2,2-dimethoxyethyl, 2-(propionyloxy)ethyl, 2-(ethoxycarbonyl)ethyl, 2-(4-chlorobenzoyloxy)ethyl, 1-(hydroxymethyl)propyl, 3-hydroxypropyl, 3-methoxypropyl, 3-acetoxypropyl, 3-morpholinopropyl and 3-(2-methylpiperidino)propyl.

4,624,699

2-SUBSTITUTED PHENYL-4,5,6,7-TETRAHYDRO-2H-INDAZOLES, THEIR PRODUCTION, AND USE AS HERBICIDES

Eiki Nagano, Hyogo; Ichiki Takemoto, Osaka; Masayuki Fukushima, Hyogo; Ryo Yoshida, Hyogo, and Hiroshi Matsumoto, Hyogo, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

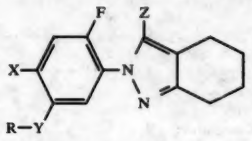
Continuation-in-part of Ser. No. 536,528, Sep. 28, 1983, abandoned. This application Mar. 28, 1985, Ser. No. 717,087

Claims priority, application Japan, Sep. 28, 1982, 57-170427; Nov. 6, 1982, 57-194893; Mar. 16, 1983, 58-045027

Int. Cl.[4] A01N *43/56;* C07D *231/56*

U.S. Cl. 71—92 8 Claims

1. A 2-substituted phenyl-4,5,6,7-tetrahydro-2H-indazole compound of the formula:



wherein X is a chlorine atom or a bromine atom, Y is an oxygen atom or an imino group, Z is a chlorine atom or a methyl group and R is a C_1–C_6 alkoxycarbonylmethyl group, a C_3–C_6 cycloalkoxycarbonylmethyl group or a C_1–C_4 haloalkoxycarbonylmethyl group.

7. A method for controlling weeds which comprises applying a herbicidally effective amount of the compound according to claim 1 to the area where weeds grow or will grow.

4,624,700

METHOD FOR CONTROLLING THE OXYGEN CONTENT IN AGGLOMERATED MOLYBDENUM POWDERS

David J. Port, Sayre; David L. Houck, Towanda, and Frank D. Kinney, Wyalusing, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 20, 1986, Ser. No. 831,201

Int. Cl.[4] B22F *9/00*

U.S. Cl. 75—0.5 BB 4 Claims

1. A method for introducing a controlled level of oxygen into agglomerated molybdenum plasma spray powder, said method comprising:

(a) forming a relatively uniform mixture of agglomerated powders consisting essentially of molybdenum, and one or more oxygen containing compounds of molybdenum wherein said mixture has an oxygen content of greater than about 10% by weight; and

(b) reducing said mixture at a sufficient temperature for a sufficient time to remove a portion of the oxygen therefrom and form a molybdenum powder having an oxygen content of no greater than about 10% by weight.

4,624,701

COREDUCTION PROCESS FOR INCORPORATION OF HALOGENS INTO CHALCOGENS AND CHALCOGENIDE ALLOYS

Santokh S. Badesha, Pittsford; Thomas W. Smith, Penfield, and Ihor W. Tarnawskyj, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 15, 1985, Ser. No. 765,747

The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.

Int. Cl.[4] C01B *19/02*

U.S. Cl. 75—0.5 A 27 Claims

1. A process for the preparation of components selected from the group consisting of halogenated chalcogens, and halogenated chalcogenide alloys which comprises providing in solution pure esters of the desired chalcogen, and subsequently subjecting a mixture of the esters and a chalcogenide halide to a coreduction reaction.

4,624,702
METHOD OF VAPORIZING ADDITIVES IN METAL MELTS

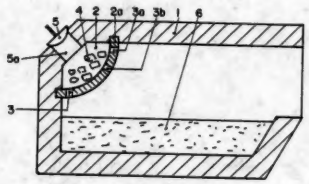
Kurt Fehr; Ivo Henych, and Rudolf Pavlovsky, all of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Nov. 7, 1985, Ser. No. 796,097

Claims priority, application Switzerland, Dec. 21, 1984, 6124/84

Int. Cl.⁴ C22B *9/00*

U.S. Cl. 75—93 R **4 Claims**



1. A method of vaporizing additives in a metal melt, comprising introducing the metal melt containing an element to be bound by the additive into a vessel and introducing at least one additive into a chamber formed by a wall in the vessel, conducting the metal melt through openings defined in the wall into the chamber into contact with the addition and thereby commencing the reaction by vaporizing the additive in the chamber and permitting the vaporized additive to flow through the chamber openings into the metal melt in the vessel, maintaining the relation of the geometric configuration and size of the chamber and the size of the total cross-sectional area of the openings to the amount T of metal melt in tons and to the element contained in the metal melt to be bound by the additive so that a vaporization time t in seconds results, and adjusting the vaporizatin time in accordance with the formula

$$t = 68 \times T^{0.22} \times A,$$

wherein A is a coefficient selected in accordance with the additive to be vaporized.

4,624,703
RECOVERY OF TUNGSTEN, SCANDIUM, IRON, AND MANGANESE VALUES FROM TUNGSTEN BEARING MATERIAL

Clarence D. Vanderpool; Martin B. MacInnis, both of Towanda, and Judith A. Ladd, Sayre, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 24, 1986, Ser. No. 821,932

Int. Cl.⁴ C22B *3/00*

U.S. Cl. 75—101 R **9 Claims**

1. A process for recovering tungsten, scandium, iron, and manganese from tungsten bearing material, said process comprising:

(a) digesting said material in sufficient sulfuric acid at a sufficient temperature for a sufficient time in the presence of a reducing agent to form a digestion solution containing the major portion of said scandium, iron, and manganese, and a digestion residue containing the major portion of said tungsten;

(b) separating said digestion solution from said digestion residue;

(c) extracting essentially all of said scandium from said digestion solution with an organic solution consisting essentially of an extracting agent which is a dialkyl phosphoric acid which is present in an amount sufficient to extract essentially all of the scandium without extracting iron and manganese, and the balance an essentially aromatic solvent;

(d) separating the resulting scandium-containing organic from the resulting raffinate;

(e) stripping the scandium from the scandium-containing organic with an aqueous solution of ammonium carbonate to form a scandium-containing ammonium carbonate solution;

(f) separating said scandium-containing ammonium carbonate from the resulting stripped organic solution;

(g) adjusting the pH of said raffinate to at least about 2 with a base;

(h) subjecting the resulting pH adjusted raffinate to an electric current for a sufficient time to electrolyze said raffinate and form iron powder containing the major portion of the iron which was in said raffinate and an electrolyzed solution containing the major portion of the manganese; and

(i) separating said iron powder from said electrolyzed solution.

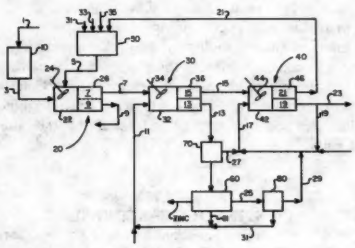
4,624,704
SELECTIVE RECOVERY OF ZINC FROM METAL CONTAINING BRINES

John J. Byeseda, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 2, 1985, Ser. No. 783,285

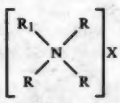
Int. Cl.⁴ C22B *19/00*

U.S. Cl. 75—101 BE **7 Claims**



1. A method of selectively extracting zinc from an aqueous brine containing zinc ions and a quantity of other metallic ions comprising calcium, iron or lead, comprising:

a. contacting said aqueous brine with an organic reagent consisting essentially of an amine salt, a phase modifier, and an organic diluent so as to form a zinc amine complex whereby zinc in said brine is selectively extracted therefrom over said other metallic ions and transferred to the organic phase, said quaternary amine salt having the general formula



where R represents an alkyl hydrocarbon group containing from eight to ten carbon atoms, R_1 is methyl group, and X represents chloride ion; and

b. contacting said zinc amine complex with an aqueous strippant comprising a neutral solution of sodium sulfate in water so as to form a sulfated quaternary amine salt whereby zinc in said zinc amine complex is stripped therefrom and tranferred to an aqueous phase thereby forming an aqueous zinc ion and chloride ion containing solution.

4,624,705

MECHANICAL ALLOYING

Arun D. Jatkar, Monroe; Paul S. Gilman, Suffern, both of N.Y., and Raymond C. Benn, Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Apr. 4, 1986, Ser. No. 848,162
Int. Cl.[4] C22C *29/02*
U.S. Cl. 75—239 8 Claims

1. A sintered and worked aluminum-base alloy adapted to be used at temperatures in excess of about 100° C., the powder precursor of said alloy having been subjected to mechanical alloying in the presence of a carbon-containing processing aid and said alloy being characterized by containing a dispersion formed in situ of particles less than about 500 A in major dimension of a carbidiferous material more stable than Al_4C_3 at temperatures above 100° C. in an aluminum matrix and said carbidiferous material containing a metal from the group of titanium, niobium, vanadium and zirconium.

4,624,706

WELD WIRE FROM EXTRUDED NICKEL CONTAINING POWDER

Frank A. Badia, Huntington, W. Va., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Jul. 2, 1985, Ser. No. 751,053
Int. Cl.[4] C22B *15/00*
U.S. Cl. 75—246 7 Claims

1. An extruded, powder metallurgy weld wire containing at least about 28% nickel and having a density of at least about 91% theoretical density, the weld wire made by:

(a) providing nickel containing powder,

(b) forming a slurry including the nickel containing powder,

(c) continuously extruding the slurry into an extrudate,

(d) conducting solid phase sintering of the extrudate, and

(e) consolidating the extrudate to a predetermined wire diameter and a density of at least about 91% theoretical density.

4,624,707

CONTINUOUS CASTING SLAG

Alan W. Cramb, New Hope, and Michael Byrne, Warminster, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 11, 1985, Ser. No. 786,675
Int. Cl.[4] C21B *5/04;* C21C *7/02*
U.S. Cl. 75—257 3 Claims

1. A synthetic slag composition for use in the tundish of a steel continuous casting facility having the ability to reduce the sulfur content in the steel, consisting essentially of

CaO: 30–80% by weight

CaF_2: 20–40% by weight

Al_2O_3: 0–10% by weight

SiO_2: <5% by weight

MgO: 5–20% by weight

FeO+MnO: <1% by weight

K_2O+Na_2O: 0–10% by weight

BaO, $+CeO_2$ (either or both): 10–70% by weight

Metalloids (Al, Ca, Mg): 0–5% by weight.

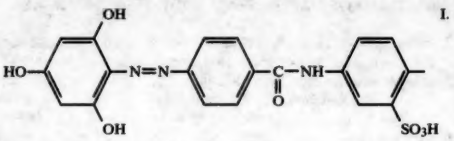
4,624,708

SULFONATED TRISAZO DYES FOR INK JET COMPOSITIONS

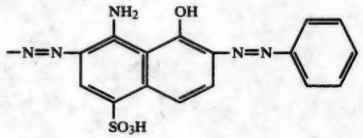
Warren E. Solodar, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

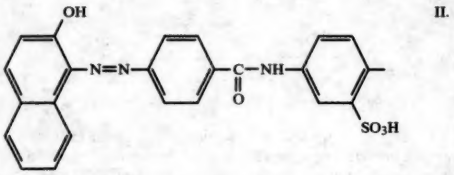
Filed Apr. 15, 1985, Ser. No. 723,376
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 8 Claims

1. An ink composition useful for ink jet printing processes comprised of an aqueous solution of a sulfonated trisazo black dye selected from the group consisting of:

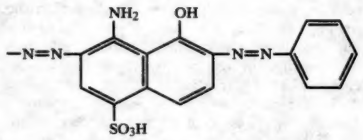


I.

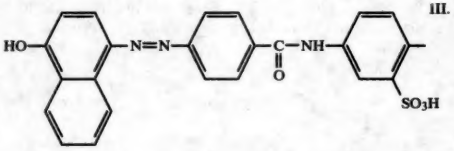




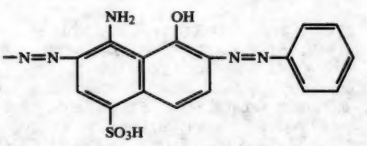
II.



and



III.



4,624,709

NIGROSINE DYES AND PROCESS FOR PREPARING SAME

Masahiro Otsuka, Osaka, Japan, assignor to Orient Chemical Industrie, Japan

Filed Oct. 11, 1983, Ser. No. 540,646
Claims priority, application Japan, Oct. 13, 1982, 57-180430
Int. Cl.[4] C07D *241/46;* C09B *57/00;* C09D *11/04, 11/00*
U.S. Cl. 106—22 19 Claims

1. A nigrosine dye represented by the formula $D—R)_n$ wherein D is a nigrosine dye moiety of the water insoluble nigrosine base C.I. 50415:1 (C.I. Solvent Black 7), n is a number from 1 to 4, and each R is a hydrocarbon radical individually selected from the group consisting of alkyl of 3 to 18 carbon atoms, alkenyl of 3 to 18 carbon atoms, aralkyl which is optionally ring substituted with an alkyl substituent of 1 to 8 carbon atoms, and aralkenyl which is optionally ring substi-

tuted with an alkyl substituent of 1 to 8 carbon atoms, said dye being recoverable in the form of crushable solid particles of high purity and having storage stability, solubility in organic solvents and compatibility with organic solvents and toner resins, said storage stability constituting stability against precipitation separation of said dye from an organic solvent solution thereof with the lapse of time.

10. Dye of claim **1**, in the form of an ink composition containing a solvent for said dye.

11. Dye of claim **1**, in the form of a toner composition containing a toner resin for developing electrostatic images in admixture therewith, said dye being present in a charge control effective amount for controlling the charge of the toner resin.

15. Dye of claim **1** in the form of a pigment composition containing pigment particles coated with said dye.

18. A process for preparing a nigrosine dye represented by the formula $D—R)_n$ wherein D is a nigrosine dye moiety of the water insoluble nigrosine base C.I. 50415:1 (C.I. Solvent Black 7), n is a number from 1 to 4, and each R is a hydrocarbon radical individually selected from the group consisting of alkyl of 3 to 18 carbon atoms, alkenyl of 3 to 18 carbon atoms, aralkyl which is optionally ring substituted with an alkyl substituent of 1 to 8 carbon atoms, and aralkenyl which is optionally ring substituted with an alkyl substituent of 1 to 8 carbon atoms, which comprises reaction a precursor nigrosine dye constituted by the water insoluble nigrosine base C.I. 50415:1 (C.I. Solvent Black 7) and containing at least one active hydrogen atom correspondingly attached to at least one nitrogen atom in the precursor dye and represented by the formula $D—H)_n$ wherein D and n are the same as defined above, and each H is a replaceable hydrogen atom correspondingly attached to a nitrogen atom in the precursor dye, with at least one corresponding hydrocarbon halide represented by the formula RX wherein R is the same as defined above and X is a halogen atom, in an organic solvent in the presence of an acid-binding agent selected from the group consisting of alkali metal compounds and alkaline earth metal compounds, and recovering as produced product the corresponding dye represented by said formula $D—R)_n$ from the resulting reaction mixture, in the form of crushable solid particles of high purity and having storage stability, solubility in organic solvents and compatibility with organic solvents and toner resins, said storage stability constituting stability against precipitation separation of said produced product dye from an organic solvent solution thereof with the lapse of time.

4,624,710

PIGMENT CONSISTING OF A MIXTURE OF CHROMIUM OXIDE AND IRON OXIDE USEFUL IN HIGH INFRA RED REFLECTANCE GRAY VINYL COMPOSITION

Zoltan M. Modly, Shaker Heights, Ohio, assignor to Harshaw/-Filtrol Partnership, Cleveland, Ohio

Filed Sep. 30, 1985, Ser. No. 781,613

Int. Cl.[4] **C08K** *3/20, 3/10;* **C04B** *14/34;* **C09C** *1/62*

U.S. Cl. 106—290 **2 Claims**

1. An inorganic pigment having high reflectance in the infra red range when blended into a polyvinyl chloride resin, said pigment prepared by cocalcining a mixture consisting essentially of the oxides of chromium and iron in a weight ratio of approximately 2.5 to 3.5 parts of chromium to 1 part of iron, said mixture having a particle size whereby at least 99% passes a 325 mesh screen.

4,624,711

LIGHT-WEIGHT AGGREGATE

Robert W. Styron, Marietta, Ga., assignor to Resource Technology, Inc., Tucker, Ga.

Filed Nov. 7, 1984, Ser. No. 669,284

Int. Cl.[4] **C04B** *14/00*

U.S. Cl. 106—308 S **16 Claims**

1. A light-weight aggregate comprising a pellitized agglomerated mixture of by weight 50 to 86 parts self-hardening fly ash formed in the combustion of sub-bituminous coal from the Powder River Basin 1 to 14 parts sulfate surfactant foam, 0 to 6 parts accelerator which is extract of silica fume dust, and 0–30 parts additive selected from the group consisting of magnesium and boron compounds, class F fly ash, incinerated sewage sludge, diatomaceous earth, fullers earth, kaolin, kiln dust, perlite, pyrophyllite, talc, ground vermiculite, ground polyethylene, cement, and magnesium silicate.

4,624,712

STOVEPIPE CLEANING APPARATUS ARRANGEMENT AND METHOD

Eugene P. Neumann, and Eleanore R. Neumann, both of Rte. 1, Box 90, Glidden, Wis. 54527

Filed Aug. 20, 1984, Ser. No. 642,082

Int. Cl.[4] **A46B** *13/08;* **B08B** *9/06;* **F23J** *3/02*

U.S. Cl. 134—8 **4 Claims**

4. A fast, convenient and dust-free method of brush-cleaning stovepipe conduiting requiring no disassembly of any of the conduiting of the stovepipes, wherein the stovepipe apparatus arrangement comprises

(a) a T-shape joint having opposed first and second openings and a transversely oriented third opening,

(b) a vertical stovepipe from a combustion stove connected to the third opening,

(c) a horizontal stovepipe connected to the first opening,

(d) a cap normally closing the second opening during times of combustion in the stove but readily removable for cleaning, and

(e) a bag and brush assembly consisting of a pliable bag about a stovepipe scrubbing brush with an attached flexible shaft, the bag having a close-fitting aperture and a mouth in opposed relationship and being symmetrical therebetween, said shaft being slidably received within said aperture, said bag being further characterized in that it functions as an envelope just sufficiently large to accommodate said brush and confine soot and dust that may fall off said brush during times of storage of said assembly,

said method comprising

(i) removing said cap from said second opening during a time when combustion in the stove is nominal or completely extinguished,

(ii) fastening said assembly at the mouth thereof to said second opening with said bag extending substantially horizontally from said opening and not in a soot-collecting depending manner therefrom, and with said brush within said bag and the shaft of said brush extending through said aperture,

(iii) scrubbing the interior of said conduiting of said joint and stovepipes by reciprocating and rotational motion of said shaft and brush in a manner causing the soot and dust to be removed therefrom and fall into the stove or the base portion of a chimney but without substantially withdrawing the same into said bag,

(iv) withdrawing said brush into said bag,

(v) disengaging said assembly from said second opening and storing the same with the brush enveloped by the bag thereof and the mouth of the bag in a substantially closed condition, and

(vi) replacing said cap onto said second opening in preparation for resuming combustion in the stove.

4,624,713

SOLID RINSE AIDS AND METHODS OF WAREWASHING UTILIZING SOLID RINSE AIDS

Stephen A. Morganson, S. St. Paul, and Erin P. Schneeman, St. Paul, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Nov. 15, 1984, Ser. No. 671,673
Int. Cl.[4] B67C 1/04
U.S. Cl. 134—25.2 12 Claims

1. A method of warewashing, including at least a wash water cycle and a rinse water cycle, which comprises dispensing, in a rinse cycle, an effective amount of a surfactant from a water soluble solid block rinse aid said rinse aid consisting essentially of:

(a) about 5–40% by weight urea;

(b) about 60–90% by weight of a polymeric synthetic organic surfactant having a molecular weight of about 700–14,000 comprising a polyethylene oxide block and a polypropylene oxide block; and

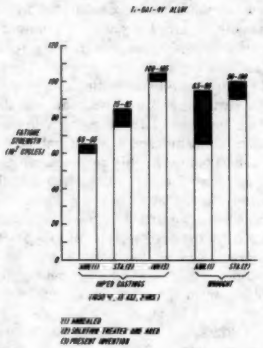
(c) sufficient water to provide a water:urea weight ratio of about 1:3 to 1:6.

4,624,714

MICROSTRUCTURAL REFINEMENT OF CAST METAL

Robert J. Smickley, Whitehall, and Louis E. Dardi, Muskegon, both of Mich., assignors to Howmet Turbine Components Corporation, Greenwich, Conn.

Continuation of Ser. No. 473,676, Mar. 8, 1983, Pat. No. 4,505,764. This application Oct. 31, 1984, Ser. No. 652,658
The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.
Int. Cl.[4] C22F 1/18
U.S. Cl. 148—3 21 Claims



1. A method of refining the microstructure of a metal casting, said metal having an elevated transformation temperature at which a first phase transforms to a second phase, said method comprising the steps of:

heating said metal casting to a treatment temperature near, but below, said transformation temperature;

diffusing a solute material into said metal casting, said solute having a physical effect such that it reduces said transformation temperature, said solute having a concentration in said metal such that it reduces said transformation temperature to at least said treatment temperature, said solute thereby inducing said transformation of said first phase to said second phase;

maintaining said metal casting at a temperature above that at which said solute would form detrimental compounds in said metal throughout said method; and

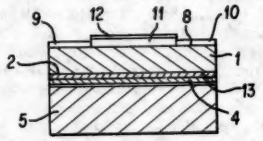
removing said solute from said metal casting by diffusion to transform said second phase back to said first phase with said first phase having a refined microstructure.

4,624,715

PROCESS FOR PASSIVATION OF PHOTOCONDUCTIVE DETECTORS MADE OF HG CD TE

André Gauthier, Paris, France, assignor to SAT, Paris, France

Filed Oct. 4, 1984, Ser. No. 657,585
Claims priority, application France, Oct. 13, 1983, 83 16261
Int. Cl.[4] C23C 22/60
U.S. Cl. 148—6.14 R 7 Claims



1. A process for passivation of photoconductive detectors comprising Hg Cd Te, which process comprises forming a layer of native oxide on at least one of the faces of a wafer of a photoconductive detector material which is then made to grow, said process being characterized in that the layer of native oxide is formed by pure chemical oxidation in an aqueous solution of $K_3Fe(CN)_6$ in a basic medium.

4,624,716

METHOD OF TREATING A NICKEL BASE ALLOY

Robert J. Noel, and Anthony Banik, both of Milwaukee County, Wis., assignors to Armco Inc., Middletown, Ohio

Continuation-in-part of Ser. No. 449,482, Dec. 13, 1982, abandoned. This application Feb. 23, 1983, Ser. No. 469,014
Int. Cl.[4] C22F 1/10
U.S. Cl. 148—12.7 N 10 Claims

1. A method of heat treating an article of a nickel base alloy consisting essentially of, in weight percent, from 0.015% to 0.09% carbon, up to 0.020% manganese, up to 0.10% silicon, up to 0.010% phosphorus, up to 0.010% sulfur, 10.90% to 13.90% chrominum, 18.00% to 19.00% cobalt, 2.80% to 3.60% molybdenum, 4.15% to 4.50% titanium, 4.805 to 5.15% aluminum, 0.016% to 0.024% boron, up to 0.50% hafnium, up to 1.60% columbium, 0.04% to 0.08% zirconium, up to 0.05% tungsten, up to 0.98% vanadium, up to 0.30% iron, up to 0.075 copper, up to 0.0002% (2ppm) lead, up to 0.00005% (0.5 ppm) bismuth, and balance essentially nickel, said method comprising the steps of:

(1) solution treating at 2050° F. to 2150° F. for about 2 hours and cooling at a rate at least as rapid as still air;

(2) stabilizing at 1750° F. to 1850° F. for ½ to 4 hours and cooling at a rate at least as rapid as still air; and

(3) precipitation hardening and air cooling;

whereby to precipitate grain boundary carbides to an acceptably low level, to obtain an optimum balance of tensile strength, stress rupture life and creep strength, and reduced residual stress in the article.

5. The method claimed in claim 1, wherein said article is fabricated from a powdered, hot isostatically pressed nickel base alloy having a particle size ranging from −100 to −325 mesh (U.S. Standard) by isothermal hot forging.

4,624,717

ALUMINUM ALLOY HEAT TREATMENT

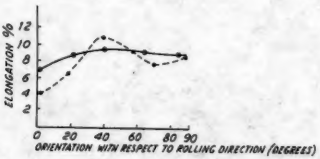
William S. Miller, Gerrards Cross, England, assignor to Alcan International Limited, Montreal, Canada

Filed Mar. 30, 1984, Ser. No. 595,447

Claims priority, application United Kingdom, Mar. 31, 1983, 8308907; Mar. 31, 1983, 8308908

Int. Cl.[4] C22F *1/04*

U.S. Cl. 148—12.7 A 20 Claims



1. A method of producing sheet or strip from a rolling ingot of an aluminium alloy which contains lithium and constituents selected from the following groups 1 and 2:

Group 1—deliberately added magnesium, copper and zinc;

Group 2—Zirconium, manganese, chromium, titanium, iron and nickel;

comprising hot rolling the rolling ingot in one or more stages to produce a hot blank; holding the hot blank at a temperature and for a time which causes substantially all of the lithium and substantially all of any of the Group 1 constituents present to be in solid solution; positively cooling the hot blank; subjecting the cooled blank to a further heat treatment at a temperature sufficient to reprecipitate those age hardening phases in solid solution, continuing the heat treatment to produce a coarse overaged morphology, and thereafter cold rolling the blank to form a sheet or strip which at any position therein and in any direction therefrom has properties of elongation that vary from those in the rolling direction by no more than 2.0%.

4,624,718

POLYESTER-POLYAMIDE TAPE INSULATED MAGNET WIRE AND METHOD OF MAKING THE SAME

John D. Hessler, Payne, Ohio, and Harry E. Eloph, Jr., Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Nov. 8, 1985, Ser. No. 796,469

Int. Cl.[4] H01B *13/06;* B32B *31/00*

U.S. Cl. 156—56 1 Claim

1. A method of making insulated magnet wire comprising high speed spirally wrapping a layer of polyester tape onto a magnet wire substrate, high speed spirally overwrapping a layer of aromatic polyamide tape on the polyester tape, induction heating the wrapped magnet wire substrate to a temperature sufficient to bond the tape materials to the magnet wire substrate, resulting in an abrasion resistant, non-fraying, oil resistant, coolant resistant, high temperature stable magnet wire.

4,624,719

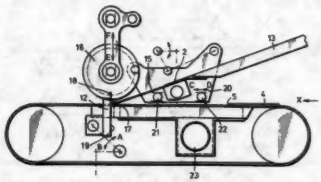
PROCESS AND DEVICE FOR LAMINATING OF SHEET TO SHEET

Klaus-Dieter Völbel, and Willi Trosdorff, both of Düsseldorf, Fed. Rep. of Germany, assignors to Tuenkers Maschinenbau GmbH, Ratingen, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,911

Int. Cl.[4] B30B *3/02, 15/04*

U.S. Cl. 156—60 3 Claims



1. In a process for laminating sheet on sheet, wherein at least one of the sheets is provided with adhesive on one side thereof and the other sheet is laminated thereon and the forward edges of the sheets are fed contactless and superimposed with each other, after a certain setting time of the applied adhesive, they are aligned against an abutment having an abutment plane and which acts on the forward edges of the sheets so that they are retained at that abutment and thereafter a movement is imparted to at least one of the sheets in a transverse direction with respect to the feeding direction in such a manner that the sheets are brought together at the area of their forward edges and the abutment is removed from the feeding path of the sheets, and thereafter the sheets are laminated with each other and removed, the improvement comprising providing means for underpinning said sheets, extending in the feeding direction up to said abutment so that the sheets are underpinned and guided to the abutment plane of said abutment which acts against the forward edges, and bending of unstable sheets in the region of their forward edges is prevented.

2. A device for laminating sheet on sheet wherein at least one of the sheets is provided with adhesive on one side thereof and the other of the sheets is laminated thereon, the device comprising at least two feeding conveyors which feed the sheets to be laminated against an abutment, said conveyors extending at an acute angle with respect to each other; and means for underpinning said sheets, extending in a feeding direction up to said abutment so that the sheets (2, 4) are underpinned and guided to an abutment plane (19) of said abutment (12), wherein an upper conveyor (13) of said feeding conveyors consists of a plurality of conveyor parts, of which a front conveyor part (15) in the feeding direction forms said underpinning means and is movable in a limited manner against the other part of the upper conveyor (13), which is stationary.

4,624,720

DIMENSIONALLY HEAT-RECOVERABLE ARTICLE

Kenneth B. Pithouse, Lesulis, France; Thomas A. Kridl, Union City, and James T. Triplett, Livermore, both of Calif., assignors to Raychem Ltd, London, England

Filed Dec. 30, 1983, Ser. No. 567,121

Claims priority, application United Kingdom, Jan. 6, 1983, 8300219; Aug. 16, 1983, 8322004

Int. Cl.[4] B29C *27/00*

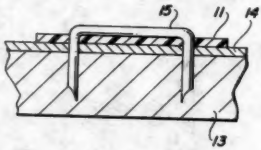
U.S. Cl. 156—86 29 Claims

1. A dimensionally heat-recoverable fabric which comprises fibres that will recover when heated to a recovery temperature thereof, wherein the recoverable fibres have a tensile strength of at least 0.1 MPa at their recovery temperature and have been stretched to an extent that will cause the fabric to recover by at least 40% when heated to the recovery temperature of the recoverable fibres.

4,624,721
METHOD OF USING A ROLL OF PERFORATED PLASTIC ROOFING TABS

David E. Sadler, 2025 23rd St. SW., Naples, Fla. 33999, and Norman A. Walters, 662 93rd Ave. N., Naples, Fla. 33963

Filed Jun. 18, 1985, Ser. No. 746,135
Int. Cl.[4] B32B 7/08
U.S. Cl. 156—92 2 Claims

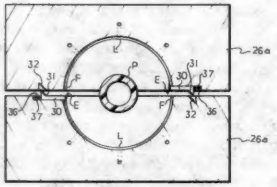


1. A method of securely fastening a strip of roofing paper onto a building panel in which a reinforcing tab is placed over the roofing paper before each staple or nail is driven through the reinforcing tab and roofing paper and into the building panel wherein the reinforcing tab is taken from a continuous roll of perforated tabs each consisting of a square of solid plastic material approximately 1¼ inches wide and 0.03 inches thick.

4,624,722
APPLYING LABELS TO BLOW MOLDED ARTICLES

Casimir W. Nowicki, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 12, 1984, Ser. No. 570,059
Int. Cl.[4] B29D 23/10; B65C 3/26; B32B 31/00; B29F 1/10
U.S. Cl. 156—156 7 Claims



1. In the method of forming an article by blow molding a parison into conformity with a cavity defined by a partible mold, the steps of

positioning a label of flexible material on each section of the mold,

said labels having relative widths in a circumferential direction such that each label has an axial edge extend beyond a side edge of the cavity forming portions of the sections of the mold,

moving the sections toward one another so that they close and define the mold cavity,

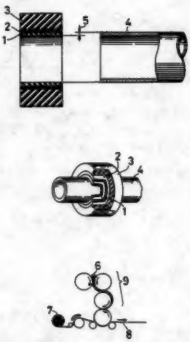
deflecting said edges of the labels which extend beyond the side edges of the cavity radially inwardly before the mold sections close by means on each of the mold sections such that as the mold sections close, each deflected edge will be in underlying relationship with an adjacent edge of an adjacent label,

and blowing the parison into conformity with the cavity such that the adjacent edges of the two labels overlap and register to define a continuous label about the article.

4,624,723
METHOD FOR MANUFACTURING A RUBBER ROLLER FOR SPINNING

Hideo Inaguma, Osaka, Japan, assignor to Yamauchi Rubber Industry Co., Ltd., Osaka, Japan

Division of Ser. No. 541,272, Oct. 12, 1983, Pat. No. 4,530,866.
This application Nov. 16, 1984, Ser. No. 672,337
Int. Cl.[4] B32B 31/04; B65H 81/00
U.S. Cl. 156—185 8 Claims



1. A method of manufacturing a rubber roller having a metal core, said method comprising the steps of:

a. pressing together an inner rubber layer having a thickness in the range of 0.5–3.0 mm and a woven cloth or sheeting reinforcing material having a thickness in the range of 0.1–0.5 mm to obtain a belt-like laminated sheet;

b. winding the belt-like laminated sheet around a metal core for molding with the inner rubber layer being on the inside towards the core and the reinforcing material being on the outside opposite the core, the metal core for molding having a diameter in the range of 0.5–2.0 mm smaller than the metal core of the rubber roller to produce an interference;

c. covering the belt-like laminated sheet wound around the core in the previous step with an outer rubber layer to form a cot;

d. vulcanizing the cot;

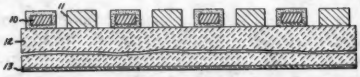
e. removing the cot from the core for molding; and

f. press-fitting the cot on the metal roller core to form the rubber roller.

4,624,724
METHOD OF MAKING INTEGRATED CIRCUIT SILICON DIE COMPOSITE HAVING HOT MELT ADHESIVE ON ITS SILICON BASE

Gary C. Davis, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 17, 1985, Ser. No. 692,088
Int. Cl.[4] B32B 31/18
U.S. Cl. 156—264 3 Claims



1. A method which comprises

(1) spin coating at about 2000 to 7000 rpm an organic solvent solution of a hot melt adhesive onto the base of a silicon wafer having a plurality of integrated circuits on its upper surface,

(2) drying the applied hot melt adhesive at an initial temperature of about 100° to 120° C., and thereafter at a temperature of about 180° to 220° C., and

(3) dicing the silicon wafer to produce a plurality of integrated circuit silicon die composites having a hot melt adhesive layer on their respective bases.

4,624,725

TWO-COMPONENT ACRYLIC MODIFIED POLYESTER ADHESIVE

Foster P. Lamm, South Windsor, and Roscoe A. Pike, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 591,729, Mar. 21, 1984, abandoned. This application Jan. 18, 1985, Ser. No. 692,456

Int. Cl.⁴ B32B *7/00*

U.S. Cl. 156—310 **1 Claim**

1. A method of bonding at least two articles together comprising:

preparing a first component having an acrylic modified polyester component, which is a reaction product of a glycidyl acrylate and a hydroxyl containing polyester, with about 0.1% to about 0.5% by weight of a peroxide,

preparing a second component comprising a polymerizable organic monomer containing about 0.1% to about 0.5% by weight of an organometallic acid salt,

applying said first component to the surface of a first article,

applying said second component to the surface of a second article, and

placing said first coated surface in contact with said second coated surface and maintaining contact until the adhesive cures.

4,624,726

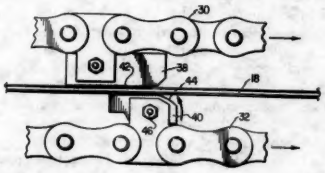
APPARATUS FOR FORMING ELONGATE STRUCTURES OF COMPOSITE MATERIALS

Jack E. Harper, Jr., Carrollton, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Jun. 6, 1985, Ser. No. 741,760

Int. Cl.⁴ B65H *20/16*

U.S. Cl. 156—323 **18 Claims**



1. An apparatus for forming elongate structures composed of composite materials comprising:

a plurality of forming dies for forming and curing an elongate portion of composite material, each of said plurality of forming dies having a shaping passage therein, each of said shaping passages being longitudinally aligned; and

puller means adapted to engage said formed and cured elongate portion of composite material and pull said portion of composite material through said plurality of forming dies, said puller means including :

a pair of endless track devices, the composite material passing between the track devices, each endless track device having an endless track for traveling along a path, a portion of the endless track path of each endless track device being disposed adjacent and parallel to the elongate direction of the composite material;

means for driving the endless track on each device so that the parallel portions travel in the same direction and at the same speed;

at least one first engagement dog mounted to a first of said endless tracks, said first engagement dog having a substantially flat surface adapted to engage one surface of said formed and cured elongate portion of composite material; and

at least one second engagement dog pivotally mounted to a second of said endless tracks, said second engagement dog having a curvilinear surface which increases in radius in the direction of movement of the composite material, said curvilinear surface adapted to engage a second surface of said formed and cured elongate portion of composite material, the first and second engagement dogs being paired, the surface of the associated pair facing each other during the portion of the paths of the endless tracks adjacent and parallel to the composite material, said second engagement dog pivoting so that the radius between the pivot axis and the portion of the curvilinear surface contacting the second surface of the formed and cured elongate portion of composite material increases as the resistance to movement of the composite material through the dies increases to more firmly engage the formed and cured elongate portion of cmposite material between the facing surfaces of the dogs, the length of the flat surface on the first engagement dog being sufficiently long in the direction of movement of the composite material so that the composite material is continuously supported by the flat surface normal to the point of application of the force exerted by the curvilinear surface on the second surface of said formed and cured elongate portion of composite material.

4,624,727

POLYIMIDES AND METHODS FOR MAKING AND USING THE SAME

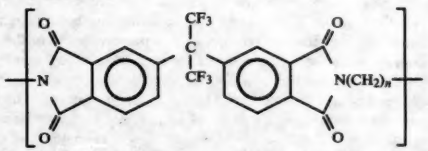
Daniel A. Scola, Glastonbury, Conn., and Ruth H. Pater, Rocky River, Ohio, assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 685,936, Dec. 24, 1984, Pat. No. 4,569,988. This application Aug. 19, 1985, Ser. No. 766,628

Int. Cl.⁴ C09J *3/14, 3/16*

U.S. Cl. 156—331.8 **1 Claim**

1. A method of bonding one article to another by placing a polyimide in contact with and between the two articles, applying pressure to said articles and exposing the polyimide to heat while under pressure, wherein the improvement comprises utilizing as the polyimide a polymer having repeating units of the formula



wherein n is 2 to about 20, the molecular weight of the polymer chain is about 5,000 to about 50,000 and the heating can be performed at temperatures below about 190° C., whereas the molecular weight of the polymer increases when heated but retains the same repeating unit.

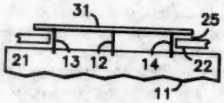
4,624,728

PIN LIFT PLASMA PROCESSING

Roger M. Bithell, Novato, and Harry Slomowitz, Walnut Creek, both of Calif., assignors to Tegal Corporation, Novato, Calif.

Filed Jun. 11, 1985, Ser. No. 743,341

Int. Cl.[4] B44C *1/22*; C03C *15/00*; H01L *21/306*; C23F *1/02*

U.S. Cl. 156—345 5 Claims

1. A parallel plate parallel reactor comprising:

a lower electrode for receiving a semiconductor wafer;

means for causing a glow discharge within said reactor, adjacent said lower electrode;

a plurality of pins within said lower electrode for engaging said semiconductor wafer; and

control means for extending said pins during said plasma discharge to lift said wafer into said discharge and to provide access to both sides of said wafer for said discharge.

4,624,729

MACHINE FOR CONTINUOUSLY ETCHING A SURFACE OF GLASS SHEETS

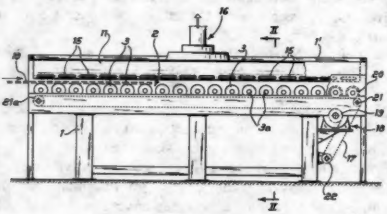
Ferruccio Bresciani, Mariano Comense, and Pietro Santambrogio, Seregno, both of Italy, assignors to Vitreal Specchi S.p.A., Mariano Comense, Italy

Filed Oct. 16, 1985, Ser. No. 788,045

Claims priority, application Italy, Oct. 30, 1984, 23374 A/84

Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—345 5 Claims



1. A machine for continuously etching a face of glass sheets comprising a roller path conveyor with a plurality of cylindrical rollers, all having the same diameter and length, horizontal axes which are mutually parallel and co-planar, and all of them being driven so as to rotate at one selected adjustable speed for the feed of a glass sheet lying on a plane defined by the upper generating lines of said rollers, the outer surface of which rollers is provided with a layer of a material capable of being wet in an acid solution contained in a lower reservoir and of transferring the same solution by contact onto the lower face of the glass sheet conveyed, there being further provided suction means for sucking vapours generated in a hood space defined over the glass sheet, as well as motor and drive means for rotating all the rollers at the same peripheral speed.

4,624,730

PORTABLE HOT-PRESS FOR THERMOWELDING MARKED AND/OR PRINTED FOILS OF THERMOPLASTIC SYNTHETIC MATERIAL

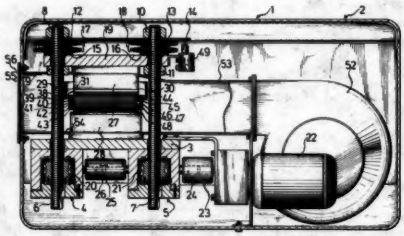
Manfred Reyer, and Klaus Schmidts, both of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Maschinenfabrik Deutschland AG, Dortmund, Fed. Rep. of Germany

Filed Aug. 16, 1984, Ser. No. 641,367

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 8123877[U]

Int. Cl.[4] B30B *1/18, 15/34*

U.S. Cl. 156—358 2 Claims



1. Portable hot-press for thermowelding marked and/or printed foils of thermoplastic synthetic material to produce single-sheet identification cards consisting only of two heating plates; one fixed and one sliding cross bar on the press and a fan for cooling said heating plates and thermowelded foils; only two screw elevating gears driven by a gearmotor for guiding and moving the sliding cross bar of the press; said two screw elevating gears being screwed to said fixed cross bar and actuating said sliding cross bar; said gear motor having a retaining brake; each screw elevating gear having only one ballscrew-type elevating screw; each screw elevating gear having only one elevating screw; two sets of cup springs mounted on said elevating screws; a limit switch for the gear motor and mounted on the sliding cross bar of the press, said cup springs operating in conjunction with said limit switch, said cup springs being compressed dependent upon the position of said limit switch, said limit switch switching off said gear motor when said cup springs are compressed by an applied press force; said elevating gears having each a worm gear with a worm shaft, said gear motor driving said worm shaft through a coupling, said gear motor having an interior holding said retaining brake; said heating plates having guide ledges for guiding a feeding tray; said screw elevating gears, fixed and sliding cross bars, heating plates and guide ledges being inclined at an angle of substantially 15° to the plane formed by feet of a housing, so that said feed tray can slide by gravity automatically on said guide ledges up to a stop; separate stacks of plastic foils being each simultaneously thermowelded between said heating plates while the applied press force remains substantially constant, so that jamming of the sliding cross bar during motion is prevented.

4,624,731

VACUUM RING FOR PRODUCING LAMINATED GLASS

Charles E. Ash, Perrysburg; Scott W. Chambers, Millbury; David R. Jenkins, Maumee, all of Ohio, and Siegfried H. Herliczek, Petersburg, Mich., assignors to Libbey-Owens-Ford Company, Toledo, Ohio

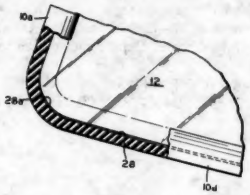
Filed Mar. 11, 1985, Ser. No. 710,287

Int. Cl.[4] B32B *31/06, 31/14*

U.S. Cl. 156—382 13 Claims

1. A vacuum ring for use in removing air spaces located between the facing surfaces of at least two laminae of a laminated assembly, said ring adapted to be coupled to a vacuum source and to be mounted about the entire peripheral edge of the laminated assembly, said ring constructed of a flexible

material and having a channel formed therein for receiving the peripheral edge of the laminated assembly, said channel defining an inner surface having a cross-sectional configuration which generally conforms to the cross-sectional configuration defined by the outer edge surface of the laminated assembly.



4,624,732
TIRE ENVELOPE SEALING APPARATUS FOR RECAPPING TIRES

Michael J. King, Concord, Calif., assignor to 501 Oliver Rubber Company, Oakland, Calif.

Filed Mar. 25, 1985, Ser. No. 715,631
Int. Cl.[4] B29C *35/02;* B29D *30/56*
U.S. Cl. 156—394.1 4 Claims

1. A device for use in vulcanizing a premolded, precured tire tread to a tire casing in a tire retreading operation which includes sealing a retreading envelope against the tire carcass in the bead area of the tire, said device, comprising:

a pair of rigid circular ring members each sized to fit against the exterior bead portion of the tire casing, with the envelope interposed between the ring and the tire casing, each said rigid circular ring member having a right angular cross section including an annular portion adapted to fit against the outer side area of a tire bead portion and a cylindrical portion adapted to fit against the inner edge surface of the tire bead and enlarged means on an outer edge of said annular portion of each of said ring members for providing a concentrated pressure on the envelope at the tire bead area to assure a fluid tight circumferential seal of the envelope around both bead portions of the tire casing;

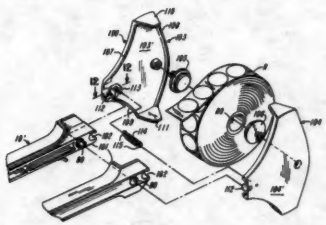
a series of interconnecting springs attached to one said ring member and retained by means on the other said ring member at circumferentially spaced apart locations for holding said ring means tightly against the bead portions of the tire casing; and

spacer means attached to at least some of said springs for maintaining a uniform distance between the bead portions of the tire casing.

4,624,733
HAND-HELD LABELER AND METHOD OF MAKING AND USING SAME

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 408,310, Aug. 16, 1982. This application Apr. 13, 1983, Ser. No. 484,404
Int. Cl.[4] B65C *11/00;* B32B *31/00;* B44C *7/00;* B65H *5/28*
U.S. Cl. 156—541 9 Claims

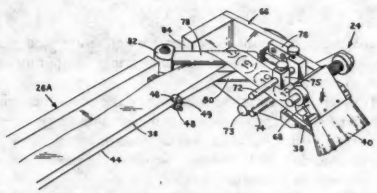


1. A hand-held labeler for applying labels releasably adhered to a carrier web, the carrier web and labels carried thereon being wound into a label supply roll, the labeler comprising: a labeler body, the body having neans providing a pathway for the carrier web, means adapted to be connected to the body for holding a label supply roll, means for advancing a carrier web from the label supply roll through the pathway, means along the pathway for successively delaminating labels from the carrier web as the carrier web is advanced, means adjacent the delaminating means for applying labels, the holding means including a pair of spaced holder members and a pair of spaced, rotatable, roll mounting members on the holder members, the mounting members being adapted to mount a label supply roll, and means providing a connection between at least one of the roll mounting members and its related holder member for enabling both rotation of that roll mounting member and maintenance of that roll mounting member parallel to the other roll mounting member irrespective of the width of the label roll.

4,624,734
LABEL DISPENSER WITH ARTICULATED GUIDE

Helmut Voltmer, Park Ridge, and Alfred F. Schwenzer, Totowa, both of N.J., assignors to New Jersey Machine Inc., Fairfield, N.J.

Filed Oct. 19, 1984, Ser. No. 662,762
Int. Cl.[4] B44C *1/00;* B32B *31/00;* B65H *26/00, 23/32*
U.S. Cl. 156—541 11 Claims



1. A label dispenser for applying labels to containers transported in a given direction of travel along a conveyer comprising:

a supply station providing a web with labels disposed thereon in pressure sensitive fashion;

a dispensing head including means for transferring labels in said direction from the web to individual ones of the containers; and

a guide assembly interconnecting said station and said head

and including means for guiding the web along a path of travel between said station and said head, said head being angled relative to said guide assembly for alignment with said direction of travel of said conveyor; and wherein

said guide assembly includes means for folding the web about itself on a line of folding thereby to bend said path of travel for alignment with said head, the line of folding being angled relative to a leg of said path by an angle in a range of approximately 40° to 50°.

4,624,735

CONSTITUENT MEMBERS OF A SEMICONDUCTOR ELEMENT-MANUFACTURING APPARATUS AND A REACTION FURNACE FOR MAKING SAID CONSTITUENT MEMBERS

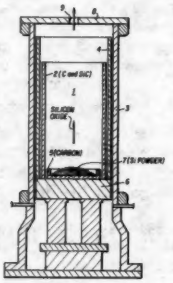
Masao Koyama, Oguni; Syuitu Matuo, Atsugi; Chiaki Nakayama, Ebina, and Katsumi Hoshina, Oguni, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 421,025, Sep. 22, 1982, abandoned, which is a division of Ser. No. 162,943, Jun. 25, 1980, Pat. No. 4,424,193. This application Feb. 11, 1985, Ser. No. 701,641

Claims priority, application Japan, Jul. 9, 1979, 54-86708

Int. Cl.⁴ C30B *35/00*

U.S. Cl. 156—610 **3 Claims**



1. A method for manufacturing a constituent member of a semi-conductor element-manufacturing apparatus, said method comprising,

(1) placing (a) a carbon substrate of the constituent member and (b) a carbonaceous vessel containing a powder comprising silica or silica and carbon, in a reaction chamber surrounded with partition walls made of carbon, silicon carbide or a mixture thereof,

(2) heating the reaction chamber to heat the carbon substrate, the carbonaceous vessel and the powder to a temperature of 1500° to 190° C. to cause the evolution of a gas comprising silicon monoxide and to cause a reaction between the carbon substrate and the silicon monoxide, thereby forming on at least one surface of the carbon substrate a silicon carbide layer having a half value width of 0.35° or less as measured by C_u—Kα rays in x-ray diffraction analysis of the (200) plane of the silicon carbide layer.

4,624,736

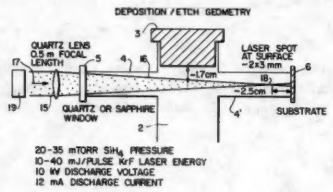
LASER/PLASMA CHEMICAL PROCESSING OF SUBSTRATES

James M. Gee, and Philip J. Hargis, Jr., both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 24, 1984, Ser. No. 634,001

Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—643 **27 Claims**



1. A process for modifying a surface of a substrate, comprising the steps of:

(a) generating radical species of a defined source;

(b) allowing the radical species to diffuse to a substrate surface which is remote from said defined source, the concentration of species at said surface being insuffient to cause spontaneous surface modification; and

(c) in the presence of the radical species, contacting at least a portion of said substrate surface with a beam of light having a predetermined intensity,

whereby said surface undergoes modification only in in said portion contacted by said light.

4,624,737

PROCESS FOR PRODUCING THIN-FILM TRANSISTOR

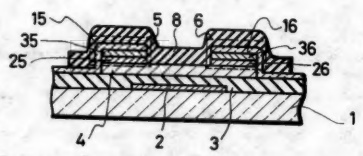
Masafumi Shimbo, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 743,092

Claims priority, application Japan, Aug. 21, 1984, 59-173848

Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—643 **4 Claims**

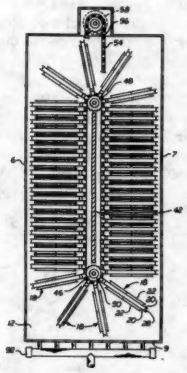


1. A process for producing a thin-film transistor comprising a first step for forming a gate electrode on an insulating substrate, a second step for continuously depositing on said gate electrode and substrate a gate insulating film, a high-resistivity semiconductor film and a conducting film containing at least a low-resistivity semiconductor film without exposing them to an oxidizing atmosphere, a third step in which said high-resistivity semiconductor film and said conducting film are selectively etched so that they are partly left as an island region on said gate electrode, a fourth step for selectively forming a source electrode and a drain electrode both contacting a part of the surface of said island region and spaced apart from each other, a fifth step for selectively removing said conducting film exposed on said island region with said source and drain electrodes serving as at least a part of the mask, a sixth step for depositing a surface passivation film, and a seventh step for selectively removing said surface passivation film and exposing a part of each of said source electrode, drain electrode and gate electrode.

4,624,738
CONTINUOUS GAS PLASMA ETCHING APPARATUS AND METHOD

Raymond T. Westfall, and Erich J. Feldl, both of Seminole, Fla., assignors to E. T. Plasma, Inc., Gulfport, Fla.

Filed Jul. 12, 1985, Ser. No. 754,854
Int. Cl.[4] B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 **31 Claims**



25. A method of continuous plasma etching of workpieces within a processing chamber, comprising the steps of:

evacuating said processing chamber and maintaining said processing chamber at a predetermined low pressure;

introducing predetermined types and quantities of processing gases into said processing chamber;

introducing workpieces into said processing chamber while maintaining said processing chamber substantially at said predetermined low pressure;

supporting and moving said workpieces along a predetermined path within said processing chamber;

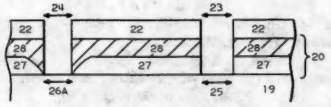
generating an electrically charged plasma within said processing chamber and surrounding said workpieces while maintaining said workpieces within an electrically neutral field; and

removing said workpieces from said processing chamber to an ambient pressure exterior location while maintaining the interior or said processing chamber substantially at said predetermined low pressure.

4,624,739
PROCESS USING DRY ETCHANT TO AVOID MASK-AND-ETCH CYCLE

Paul E. Nixon; Murty S. Polavarapu, and David Stanasolovich, all of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 9, 1985, Ser. No. 764,148
Int. Cl.[4] B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 **10 Claims**



1. A process for simultaneously etching holes through both thick and thin portions of a layer on a substrate, comprising the steps of:

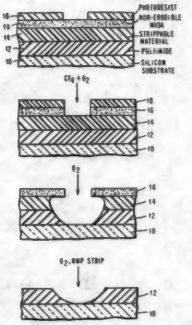
masking the surface of said layer with a mask having a first window over said thin portion of said layer and a second window over said thick portion of said layer;

exposing the upper surface of said layer through said first window and through said second window to an anisotropic dry etchant until said exposed layer in said first and said second windows is etched down to the substrate, said anisotropic dry etchant selectively etching said layer relative to said substrate and said mask.

4,624,740
TAILORING OF VIA-HOLE SIDEWALL SLOPE

Allan D. Abrams; Robert C. Bausmith; Karey L. Holland, and Steven P. Holland, all of Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,698
Int. Cl.[4] H01L 21/312; B44C 1/22; C03C 25/06
U.S. Cl. 156—643 **11 Claims**



1. A method of forming via holes with sidewalls having a predetermined slope in a first polyimide layer having a first thickness, comprising the steps of:

forming a partially cured second polyimide layer of a second thickness on said first polyimide layer;

forming a first mask layer on said second polyimide layer;

etching apertures in said first mask layer by exposing photolithographically defined regions of said first mask layer to a first etchant which does not appreciably etch said second polyimide layer;

isotropically etching apertures in both of said second polyimide layer and said first polyimide layer through said apertures in said first mask layer by exposure to an O2 plasma which does not etch said first mask layer, said second polyimide layer and said first polyimide layer being etched at substantially the same rate, the slope of the sidewalls of the via holes etched in said first polyimide layer being a function of said thickness of the second polyimide layer with respect to said thickness of said first polyimide layer;

removing said first mask layer by exposure to said first etchant; and

removing said second polyimide layer by exposure to a wet etchant which does not appreciably etch said first polyimide layer.

4,624,741
METHOD OF FABRICATING ELECTRO-MECHANICAL MODULATOR ARRAYS

Joseph J. Daniele, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1985, Ser. No. 808,798
Int. Cl.[4] H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—645 **8 Claims**

1. A method of fabricating small chips of flexible finger

arrays for abutting engagement with other like chips to form a longer composite finger array, said chips having a well under one end of each of said fingers into which individual fingers can deflect on application of a potential thereto, comprising the steps of:

(a) forming a silicon dioxide layer on one side of a (100) silicon wafer;

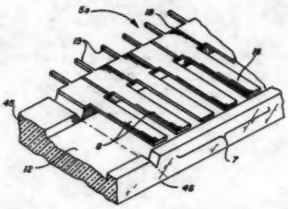
(b) forming a conductive and reflecting layer on said silicon dioxide layer;

(c) masking said conductive layer with a mask defining at least one row of fingers extending longitudinally along said wafer in spaced side by side relation;

(d) etching said wafer to remove said conductive layer except where masked;

(e) masking said wafer with a mask outlining said well, said mask having line-like openings extending between selected pairs of fingers defining the ends of each of said chips;

(f) etching said wafer to remove said silicon dioxide layer except where masked;



(g) using the silicon dioxide as a mask, etching said wafer to form said well and separation grooves for the ends of said chips, said grooves having walls paralleling said wafer (111) crystalline planes;

(h) forming a relatively wide groove in the opposite side of said wafer for each of said separation grooves, each of said wide grooves being parallel to and offset from its associated separation groove so that the (111) plane of said separation grooves intercepts the wide groove associated therewith, said separation grooves intercepting adjacent to the midpoint of said wide groove, the depth of said wide grooves being insufficient for said wide grooves to intercept said well; and

(i) applying a downward bending force to said wafer proximate each of said V-shaped grooves to cause said wafer to fracture along the (111) plane between each separation groove and its associated wide groove whereby to provide individual chips having uniformly flat, precisely controlled ends.

4,624,742

METHOD OF DETERMINING BLACK LIQUOR SOLIDS CONCENTRATION REMAINING IN A WASHED PULP MAT

Edward P. Klein, and Thomas M. Neider, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Feb. 27, 1984, Ser. No. 583,988
Int. Cl.[4] D21C 9/02, 9/06
U.S. Cl. 162—49 **3 Claims**

1. A method of monitoring the operational efficiency of brown stock pulp washers comprising the steps of:

A. Accumulating a wet fibrous mat of pulp on a traveling porous screen from a first aqueous suspension of pulp fiber and black cooking liquor by filter separation of a portion of said black cooking liquor through said screen;

B. Transporting said wet mat on said screen along a carriage route between a first zone of mat accumulation to a second zone whereat the fiber of said mat is slurried into a second aqueous suspension, said carriage route passing through a third zone located between said first and second zones, whereat wash liquor is applied to said mat to flush additional black cooking liquor therefrom;

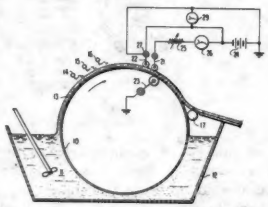
C. First correlating a range of dissolved solids concentration values occurring in the black cooking liquor constituent of said first aqueous suspension to a corresponding range of specific electrical conductivity values respective to said black liquor constituent;

D. Continuously measuring, in situ, the specific conductivity of said mat along the mat carriage route between said third zone and said second zone; and

E. Relating said measured specific conductivity to said first correlation for determination of the dissolved solids concentration value remaining in said mat following said wash liquor application.

2. A method of determining the effectiveness of a pulp washing process to remove dissolved solids from the presence of digested paper pulp comprising the steps of:

A. Developing a first correlation between (1) concentration levels of dissolved solids found in an aqueous solution with which said pulp is mixed and (2) electrical resistance values respective to said aqueous solution dissolved solids concentration levels;



B. Developing a fibrous mat from said pulp mixture for carriage along an increment of a traveling, filter screen circuit of said washing apparatus, said mat being supported on a surface of said screen along said travel increment;

C. Distributing wash liquor onto the surface of said screen supported mat at a fixed position along said circuit increment for partial displacement of dissolved solids containing aqueous solution retained within interstitial pores of said mat, said fixed position being located between a first zone of mat development and a second zone of mat dispersal;

D. Continuously measuring the specific resistance of said mat, in situ, between said mat surface and said carriage screen surface at a point along said circuit increment between said fixed position of wash liquor distribution and said second zone of mat dispersal; and

E. Relating said measured specific resistance to said first correlation for determination of the dissolved solids concentration level remaining in said interstitial pores of said mat.

4,624,743

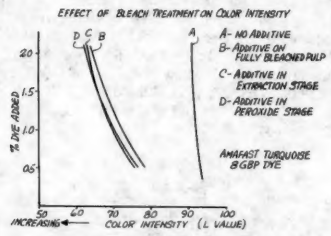
CATIONIC CELLULOSE PRODUCT AND METHOD FOR ITS PREPARATION

Jerome M. Gess, Bellevue, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 24, 1983, Ser. No. 507,365
The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.
Int. Cl.[4] D21H 3/48
U.S. Cl. 162—164.1 **12 Claims**

1. A fibrous cationic cellulose product comprising the product made by reacting cellulose fibers in aqueous suspension with a cationizing agent selected from the group consisting of crosslinked and uncrosslinked condensates of epichlorohydrin

and dimethylamine and mixtures thereof wherein the crosslinking agent, if present, is selected from the group consisting of ammonia and a primary aliphatic diamine of the type H_2N—


EFFECT OF BLEACH TREATMENT ON COLOR INTENSITY
A- NO ADDITIVE
B- ADDITIVE ON FULLY BLEACHED PULP
C- ADDITIVE IN EXTRACTION STAGE
D- ADDITIVE IN PEROXIDE STAGE
AMAFAST TURQUOISE 8 GBP DYE
% DYE ADDED
INCREASING
COLOR INTENSITY (L VALUE)

$R—NH_2$ when R is an alkylene radical of from 2 to 8 carbon atoms, said cationic product having a nitrogen content of at least 0.02%, said reaction being carried out at a pH greater than 9.

4,624,744

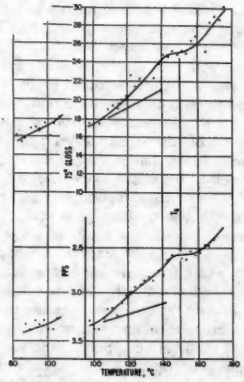
METHOD OF FINISHING PAPER UTILIZING SUBSTRATA THERMAL MOLDING

Jay H. Vreeland, Yarmouth, Me., assignor to S. D. Warren Company, Philadelphia, Pa.

Filed May 18, 1984, Ser. No. 611,766

Int. Cl.[4] D21F *11/00*; D21G *1/00*; B05D *3/12*

U.S. Cl. 162—206 **21 Claims**



1. Process for producing gloss and smoothness on the surface of a paper web, comprising the steps of:

A. providing a finishing apparatus comprising a smooth metal finishing drum and a resilient backing roll pressed against the drum at a force up to 700 KN/M (4000 pounds per lineal inch) to form a nip with pressure against the paper of at least 13,780 KN/M^2 (2000 pounds per square inch) and less than 60,000 KN/M^2 (8,700 pounds per square inch);

B. advancing a web of papermaking fibers having a moisture content of from 3% to 7% of the bone dry weight of the fibers through the nip at a speed which results in the web dwelling in the nip from 0.3 milliseconds to 12 milliseconds; and

C. simultaneously with step B, heating the drum to a surface temperature having a value between 20° C. below and 25° C. above the Ts value determined by the following formula:

$$Ts=[Ti\times 0.357t^{-0.479}-234.2e^{-0.131m}]/[0.357t^{-0.479}-1]$$

where:

Ts=surface temperature of the heated drum, in °C.;

Ti=the initial temperature of the web just prior to entering the nip, in °C.;

t=dwell time of the web in the nip, in milliseconds;

e=the base of the natural logarithm; and

m=moisture content of the fibers in the web in weight percent of the bone dry fiber weight.

4,624,745

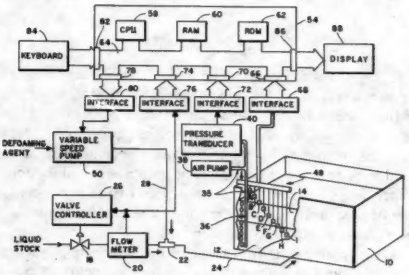
FOAM CONTROLLER

Walter E. Sande; Barrie D. Stroud, both of Shelton, and Dan P. Dumdie, Vancouver, all of Wash., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 31, 1984, Ser. No. 645,978

Int. Cl.[4] B01D *19/04*; D21C *3/28*

U.S. Cl. 162—252 **13 Claims**



1. An apparatus for controlling the quantity of foam within a vessel which is supplied with a liquid through a first conduit and with a defoaming agent through a second conduit, and which holds a mixture formed of liquid and foam, said apparatus comprising:

liquid sensing means for generating a first signal that is a function of the quantity of the liquid in the vessel,

foam sensing means for generating a second signal that is a function of the quantity of foam in the vessel,

control means responsive to the first and second signals for controlling the rate of flow of the defoaming agent through the second conduit to limit the quantity of foam within the vessel to an acceptable value,

said liquid sensing means including means for sensing the pressure of liquid in said vessel at a location near the bottom of the vessel, and means for determining the effective height of the liquid from said sensed pressure,

said foam sensing means detects the height of the upper surface of the mixture,

computer means for determining the quantity of foam in the vessel from the effective height of the liquid and the height of the upper surface of the mixture, and

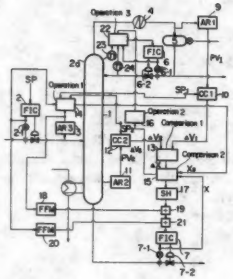
control means for controlling the rate of flow of the defoaming agent through the second conduit in response to the determined quantity of foam in the vessel to limit the quantity of foam in the vessel to an acceptable value.

4,624,746

PROCESS FOR CONTROLLING DISTILLATION COLUMN

Teruaki Hiramatsu, Omiya, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,175
Claims priority, application Japan, Aug. 9, 1983, 58-144484
Int. Cl.[4] B01D 3/42
U.S. Cl. 203—3 1 Claim



1. A process for controlling a distillation column in which feedstock is distilled for separation into a product from the top of the column having a first predetermined content of an intended component with a high boiling point and a product from the bottom of the column having a second predetermined content of an intended component with a low boiling point by controlling the flow rate of either one of the products and a part of said product from the top of the column is refluxed to the column comprising the steps of:

(a) computing a desired value of the flow rate of said product from the bottom of the column in accordance with a material balance;

(b) controlling the flow rate of said product from the bottom of the column in accordance with a first corrected desired value which is obtained by correcting the desired value of the flow rate of said product from the bottom of the column in response to the larger one of a first deviation between the first content of the intended component with a high boiling point and its desired value and a second deviation between the second content of the intended component with a low boiling point and its desired value when the control directions of the flow rate of said product from the bottom of the column determined by the polarities of the first and second deviations are the same;

(c) controlling the flow rate of said product from the bottom of the column in accordance with a second corrected desired value which is obtained by correcting the desired value in response to the second deviation when the control directions of the flow rate of said product from the bottom of the column determined by the polarities of the first and second deviations are different and controlling the reflux rate in response to the larger one of the first and second deviations; and

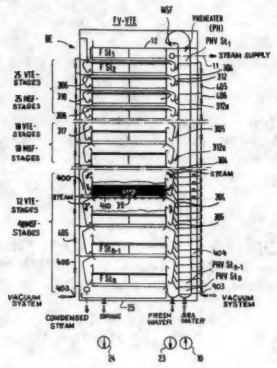
(d) controlling the flow rate of said product from the bottom of the column in accordance with the limit values for a given range when the first and second desired values do not fall in said range and controlling the reflux rate in accordance with said limit values.

4,624,747

PROCESS FOR THE DISTILLATION OF FRESH WATER FROM SEA WATER

Gamal el Din Nasser, Puchheim, Fed. Rep. of Germany, assignor to D.V.T. Büro für Anwendung Deutscher Verfahrenstechnik H. Morsy, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 496,709, May 20, 1983. This application Oct. 9, 1985, Ser. No. 786,167
Claims priority, application Fed. Rep. of Germany, May 24, 1982, 3219386; Oct. 27, 1982, 3239816
Int. Cl.[4] C02F 1/06; B01D 3/06
U.S. Cl. 203—11 5 Claims



1. Process for the distillation of fresh water from sea water by film evaporation in a multiple stage vertical tube evaporator (VTE) process where the stages are arranged vertically one below the other with the uppermost stage forming the first VTE process stage and the lowermost stage forming the last VTE process stage with each stage containing a vertical tube evaporator and with the sea water being passed generally vertically downwardly through each VTE stage which has an upper inlet and a lower outlet spaced apart in the vertical direction and each of the stages extending two dimensionally transversely of the vertical direction, comprising the steps of passing sea water unwardly through a multi-stage preheater laterally coextensive with the multiple stage vertical tube evaoorator from a lowermost stage to an uppermost stage, passing the sea water from the uppermost stage of the preheater into and downwardly through the first VTE process stage from the inlet to the outlet and heating the sea water for forming a liquid component and a steam component of the sea water, collecting the liquid component and the steam component from the outlet of the first VTE stage and distributing the liquid component of the sea water transversely across the inlet of the next lower VTE stage for flow downwardly therethrough and conveying the steam component from the first VTE stage into at least one stage of a multiple stage flash (MSF) evaporator located laterally alongside the first VTE stage where the stages of the multiple stage flash (MSF) evaporator are arranged one below the other laterally alongside the vertical tube evaporator and including an uppermost stage and a lowermost stage and condensing the steam component and forming fresh water, collecting fresh water condensed from the steam component conveyed into the at least one MSF stage, passing the condensed fresh water downwardly to the next lower MSF stage and flashing at least some of the condensed fresh water in the next lower MSF stage, circulating the steam component from the next lower MSF stage through the next lower VTE stage, continuing the downward flow of the liquid and steam components, in turn, through the remaining VTE and MSF stages, removing the concentrated liquid component of the sea water from the final VTE stage and removing the condensed fresh water from the final MSF stage,

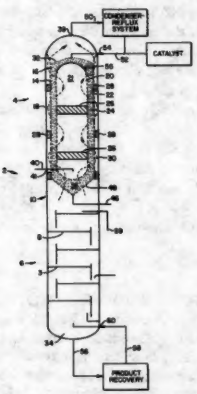
providing a preheating stage in communication with each said MSF stage and circulating the steam component from the MSF stage into the communicating preheating stage for preheating the sea water flowing upwardly therethrough, collecting inert gases separating from the steam in each component combined stage of the VTE and MSF stages and each stage of the preheating stages, and removing the collected inert gases by suction from each combined stage of the VTE and MSF stages and from each of the preheating stages.

4,624,748

CATALYST SYSTEM FOR USE IN A DISTILLATION COLUMN REACTOR

Willard M. Haunschild, Tillamook, Oreg., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 29, 1984, Ser. No. 625,995
Int. Cl.[4] B01D *3/00*
U.S. Cl. 203—29 4 Claims



1. A catalyst system for use in a distillation column reactor comprising:

(a) a first wall, formed at least in part of a vapor-permeable material, positioned within a wall of the distillation column reactor to define a first space;

(b) a second wall, formed at least in part of a vapor-permeable material, located within the first wall, the second wall defining a central space and the first and second walls defining a second space;

(c) means to retain a packed bed of catalyst in the second space;

(d) a plurality of vapor barrier means positionable alternately in the central space and the first space in a spaced apart relationship perpendicularly along an axis common to the walls;

(e) liquid inlet means and liquid outlet means positioned at opposite ends of the catalyst packed bed retaining means; and

(f) vapor inlet means and vapor outlet means positioned at opposite ends of the catalyst packed bed.

4,624,749

ELECTRODEPOSITION OF SUBMICROMETER METALLIC INTERCONNECT FOR INTEGRATED CIRCUITS

Jimmy C. Black; Bruce E. Roberts, both of Palm Bay, and Dyer A. Matlock, Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 3, 1985, Ser. No. 771,712
Int. Cl.[4] C25D *5/02*
U.S. Cl. 204—15 20 Claims

1. A method of forming a metallization pattern on the surface of a support structure comprising the steps of:

(a) selectively forming a metallization mask over the surface of said support structure, to thereby expose surface regions thereof on which said metallization pattern is to be formed;

(b) exposing said mask to electromagnetic radiation so as to effectively increase the rigidity of the surface of said mask and thereby enhance the ability of said mask to resist removal during subsequent electrodeposition of metal onto said surface regions; and

(c) immersing the structure obtained in step (b) in an electroplating solution and causing metal to be electrodeposited from said solution onto said surface regions by modulating electroplating current through the flow of which said metal is electrodeposited on said surface regions.

4,624,750

PROCESS FOR CORROSION PROTECTION OF A STEAM GENERATOR TUBE AND DEVICE FOR MAKING USE OF THIS PROCESS

Philippe A. Malagola, Paris, and Jean-Marie J. Vassal, Plaisir, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed May 30, 1985, Ser. No. 739,252
Claims priority, application France, May 30, 1984, 84 08550
Int. Cl.[4] C25D *7/04*
U.S. Cl. 204—26 6 Claims

1. Process for corrosion protection of a steam generator tube (1) fixed by crimping in a thick tube plate (2) between the face of the tube plate coming into contact with the fluid delivering heat to the steam generator in the vicinity of which face the end (4) of the tube (1) is welded to the plate (2) and the other face of the tube plate (2) through which the tube (1) enters the zone of the steam generator receiving the water to be vaporized, in which a metal layer (10) compatible with the material of the tube (1) is deposited by electrolysis on the inner surface of the tube (1) after it is fixed in the tube plate (2) by crimping on either side of the face of the tube plate (2) in contact with the water to be vaporized, over a length which is appreciably greater than the length of the transition zone (5) between the part (4) distorted by the crimping and the undistorted part of the tube (1).

4,624,751

PROCESS FOR FIBER PLATING AND APPARATUS WITH SPECIAL TENSIONING MECHANISM

Louis G. Morin, Tarrytown, N.Y., and Robert E. Hoebel, Bristol, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 507,619, Jun. 24, 1983, abandoned.
This application Jul. 16, 1984, Ser. No. 661,861
Int. Cl.[4] C25D *7/06, 17/00*
U.S. Cl. 204—28 21 Claims

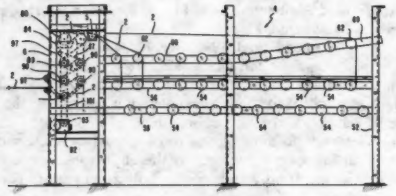
1. A process for electroplating fiber comprising:

(a) continuously passing the fiber over a contact into an electrolyte solution in a tnak in which a metal anode is immersed;

(b) passing D.C. current through the fibers to the anode; and

(c) imposing a tension on the fiber by passing the fiber over an array of tension rollers in a path that reverses the direction of the fiber and rotating the tension rollers in the

direction of the fiber at a speed equal to or less than the speed of the fiber to insure a direct tight path than the speed of the fiber to insure a direct tight path from the



fiber at the contact point to the electrolyte in the tank, whereby metal from the anode migrates to the fiber and is bonded thereto.

4,624,752

SURFACE PRETREATMENT OF ALUMINIUM AND ALUMINIUM ALLOYS PRIOR TO ADHESIVE BONDING, ELECTROPLATING OR PAINTING

David J. Arrowsmith, Edgbaston, and Andrew W. Clifford, Weymouth, both of England, assignors to The Secretary of State for Defence in Her Brittanic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, London, England

Continuation of Ser. No. 614,837, May 29, 1984, abandoned.

This application Sep. 3, 1985, Ser. No. 771,174

Claims priority, application United Kingdom, Jun. 2, 1983, 8315203

Int. Cl.[4] C25D *5/50*

U.S. Cl. 204—37.6 **16 Claims**

1. A method for surface pretreatment of aluminium or aluminum alloy prior to bonding a material thereto comprising the successive steps of:

(a) hard anodising the aluminum in sulphuric acid to produce a thick layer, which is environmentally stable and unaffected by the presence of water, of a dense-packed, thick-walled anodic coating (alumina), and

(b) etching the anodised surface using phosphoric acid, the etch step conditions being within a range of times and temperatures such as to produce a textured surface suitable for bonding while leaving the inner part of the alumina coating unaffected, such that when a material is bonded to the aluminum the interface between them exhibits environmental stability and is not affected by the presence of water.

4,624,753

METHOD FOR ELECTRODEPOSITION OF METALS

George E. McManis, III, 1013 Sherri; Aaron N. Fletcher, P.O. Box 1314, and Dan E. Bliss, P.O. Box 1999, all of Ridgecrest, Calif. 93555

Filed Jun. 5, 1985, Ser. No. 741,498

Int. Cl.[4] C25D *3/44*

U.S. Cl. 204—58.5 **13 Claims**

1. A method for the electrodeposition of a metal upon a conductive substrate which comprises:

(a) providing an electrochemical cell;

(b) introducing into said cell a non-aqueous ionic liquid composition comprising:

(1) a solvent;

(2) a nitrate salt electrolyte; and

(3) an anhydrous metal salt;

(c) maintaining the temperature of said ionic liquid composition in said cell at about 23° C.;

(d) placing a conductive cathode substrate into said melt; and

(e) effecting electrodeposition of said metal ion at about 10 $mAcm^{-2}$ until a metal deposit is formed upon said cathode substrate.

4,624,754

IONIC LIQUID COMPOSITIONS FOR ELECTRODEPOSITION

George E. McManis, III, 1013 Sherri; Aaron N. Fletcher, P.O. Box 1314, and Dan E. Bliss, P.O. Box 1999, all of Ridgecrest, Calif. 93555

Filed Jun. 5, 1985, Ser. No. 741,340

Int. Cl.[4] C25D *3/44*

U.S. Cl. 204—58.5 **10 Claims**

1. A non-aqueous ionic liquid composition for use in the electrodeposition of a metal upon a conductive substrate at a room temperature of approximately 23° C. comprising a solvent, a nitrate salt electrolyte and an anhydrous metal salt.

4,624,755

PREPARATION OF IONIC LIQUIDS FOR ELECTRODEPOSITION

George E. McManis, III, 1013 Sherri; Aaron N. Fletcher, P.O. Box 1314, and Dan E. Bliss, P.O. Box 1999, all of Ridgecrest, Calif. 93555

Filed Jun. 5, 1985, Ser. No. 741,493

Int. Cl.[4] C25D *3/44*

U.S. Cl. 204—58.5 **10 Claims**

1. A method for the preparation of a non-aqueous ionic liquid used in metal electrodeposition comprising:

(a) providing a sealable heat tolerant vessel;

(b) introducing into said vessel a composition comprising a solvent, a nitrate salt electrolyte and an anhydrous metal ion producing complex;

(c) sealing said vessel to form an airtight seal;

(d) heating said vessel and said composition contained therein to about 120° C. for about 15 minutes to obtain an anhydrous ionic liquid melt;

(e) cooling said vessel and said composition to about 23° C.; and

(f) recovering said non-aqueous ionic liquid.

4,624,756

METHOD FOR PRODUCTION OF ORGANIC ELECTROCONDUCTIVE CRYSTALS

Hiro Matsuda; Hachiro Nakanishi; Masao Kato, all of Ibaraki; Yuji Orihashi, Hino; Norihisa Kobayashi, and Eishun Tsuchida, both of Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,502

Claims priority, application Japan, Mar. 4, 1985, 60-42491

Int. Cl.[4] C25C *3/00*

U.S. Cl. 204—59 R **6 Claims**

1. A method for the production of organic electroconductive crystals, characterized by the steps of preparing a solution containing an alkali salt of dicyanometallophthalocyanine as an electrolyte and electrolyzing said electrolyte thereby causing deposition of cyanometallophthalocyanine crystals.

4,624,757

ELECTROCATALYTIC METHOD FOR PRODUCING QUINONE METHIDES

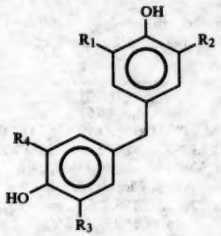
Zenon Lysenko, and Eric E. Bancroft, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 6, 1986, Ser. No. 816,501

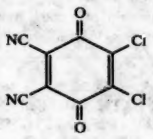
Int. Cl.[4] C07B *29/06;* **C07C** *49/64*

U.S. Cl. 204—78 **7 Claims**

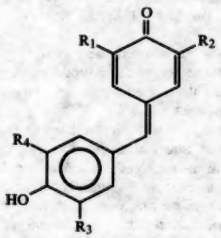
1. A process for preparing quinone methides from bis(4-hydroxyphenyl)methanes comprising electrocatalytically oxidizing a bis(4-hydroxyphenyl)methane having the formula



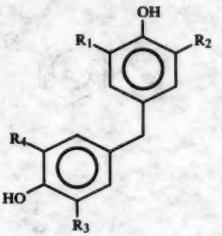
wherein R_1, R_2, R_3, and R_4 are either alike or different members selected from the group consisting of hydrogen, straight or branched chain alkyl moieties, cyclic alkyl compounds, halogen compounds, hydroxy and methoxy compounds, and combinations thereof, utilizing as an oxidant 2,3-dichloro-5,6-dicyano-1,4-benzoquinone having the formula



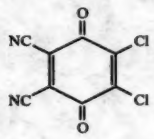
to produce spent oxidant and a quinone methide having the formula



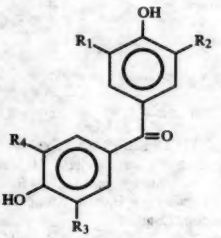
wherein R_1, R_2, R_3 and R_4 are as previously recited.



wherein R_1, R_2, R_3, and R_4 are either alike or different members selected from the group consisting of hydrogen, straight or branched chain alkyl moieties, cyclic alkyl compounds, halogen compounds, hydroxy and methoxy compounds, and combinations thereof, utilizing as an oxidant 2,3-dichloro-5,6-dicyano-1,4-benzoquinone having the formula



to produce spent oxidant and a dihydroxybenzophenone having the formula



wherein R_1, R_2, R_3 and R_4 are as previously recited.

4,624,758

ELECTROCATALYTIC METHOD FOR PRODUCING DIHYDROXYBENZOPHENONES

Zenon Lysenko, and Eric E. Bancroft, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 6, 1986, Ser. No. 816,502

Int. Cl.[4] C07B *29/06*; C07C *49/64*

U.S. Cl. 204—78 **14 Claims**

1. A process for preparing dihydroxybenzophenones from bis(4-hydroxyphenyl)methanes comprising electrocatalytically oxidizing a bis(4-hydroxyphenyl)methane having the formula

4,624,759

ELECTROLYTIC METHOD FOR PRODUCING QUINONE METHIDES

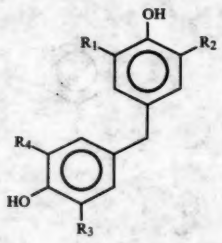
Zenon Lysenko, and Eric E. Bancroft, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 6, 1986, Ser. No. 816,503

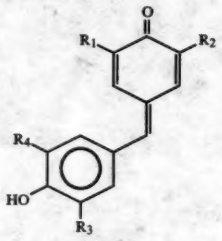
Int. Cl.[4] C07B *29/06*; C07C *49/64*

U.S. Cl. 204—78 **4 Claims**

1. A process for preparing quinone methides from bis(4-hydroxyphenyl)methanes comprising electrolytically oxidizing a bis(4-hydroxyphenyl)methane having the formula



wherein R_1, R_2, R_3, and R_4 are either alike or different members selected form the group consisting of hydrogen, straight or branched chain alkyl moieties, cyclic alkyl compounds, halogen compounds, hydroxy and methoxy compounds, and combinations thereof in an anode compartment containing a supporting electrolyte solution and biased at a potential of 1.1 V–1.5 V vs. SCE to produce a quinone methide having the formula



wherein R_1, R_2, R_3 and R_4 are as previously recited.

4,624,760

FILTER CLEANING

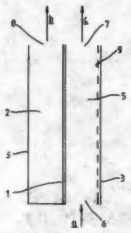
John S. Pottinger, Newbury; Andrew D. Turner, Abingdon; William R. Bowen, Wantage, and Dennis R. Cox, Reading, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jun. 7, 1985, Ser. No. 742,709

Claims priority, application United Kingdom, Jun. 21, 1984, 8415887

Int. Cl.⁴ C25F *1/00*

U.S. Cl. 204—141.5 **6 Claims**



1. A method of cleaning a porous electrically conducting filter during use of the filter in the treatment, by filtration, of an aqueous process liquid comprising the steps of

(i) establishing an electrochemical cell comprising a first electrode constituted by the filter, a counter electrode, and an electrolyte constituted by the process liquid, and

(ii) operating the cell to electrolyze the electrolyte thereby generating a gaseous product of said electrolysis at the filter to effect cleaning thereof, the process liquid being caused to flow continuously through the filter and the cell being operated periodically to effect said cleaning of the filter.

4,624,761

POLYMERIC MATERIAL COMPOSED OF SHEETS OF POLYDIACETYLENE AND POLYACETYLENE CHAINS

Jerome B. Lando, Shaker Heights, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio

Filed Dec. 21, 1983, Ser. No. 563,952

Int. Cl.⁴ C08F *2/46*

U.S. Cl. 524—80 **5 Claims**

1. A polymeric material which in the undoped state is semiconducting which is composed of a plurality of parallel sheets of regular two-dimensional networks of polydiacetylene and polyacetylene chains interconnected by a plurality of methylene units, with the number of methylene units ranging from 5 to 8, and with said polymeric material having been formed by polymerizing a monomer having the structural formula $HC{\equiv}C{-}(CH_2)_n{-}C{\equiv}C{-}C{\equiv}C{-}(CH_2)_n{-}C{\equiv}CH$ wherein n has a value of 5 to 8, with said polymerization being effected by means of gamma rays or UV irradiation.

4,624,762

METHOD FOR CATHODIC ELECTROCOATING COMPOSITION COMPRISING PIGMENTED AQUEOUS LATEX BINDER

Kirk J. Abbey, Medina; David J. Foss, Chagrin Falls, and Barbara L. Kunz, Bay Village, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,483

Int. Cl.⁴ C25D *13/06, 13/10*

U.S. Cl. 204—181.7 **12 Claims**

1. A method for cathodic electrocoating an electrically conductive article serving as a cathode in an electrical circuit consisting of said cathode, an anode, and an electrodepositable paint which comprises:

(A) providing a cathodic electrocoating paint composition comprising an aqueous dispersion of pigment and film-forming, amino-stabilized cation-active binder therefor, said binder consisting essentially of at least one of the following thermosetting combinations:

(1) synthetic cation-active latex and resinous pigment dispersant that is crosslinkable therewith, with the proviso that when said dispersant is substantially in excess of about 15% of said latex, an external crosslinker is present that will crosslink upon curing with at least said dispersant; or

(2) synthetic cation-active latex and resinous pigment dispersant that is not crosslinkable therewith and external crosslinker that will crosslink with both said latex and said dispersant;

(B) depositing said paint on said cathode by imposing an electrical current on said circuit to cause said paint to deposit as a coating on the cathode article;

(C) removing the coated substrate; and

(D) curing said substrate to produce an article having a solvent resistant coating thereon.

4,624,763

SEPARATION OF DISPERSED PHASE FROM PHASE MIXTURE

Robert J. L. Chimenti, Short Hills, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 17, 1984, Ser. No. 601,275

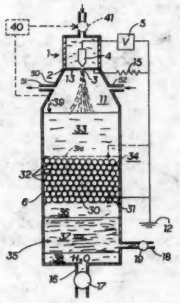
Int. Cl.⁴ B03C *5/02;* C02F *1/48;* C10G *33/02*

U.S. Cl. 204—188 **23 Claims**

1. A method for use in the separation of a dispersed contaminant phase from a continuous liquid phase, the two phases

together forming a phase mixture, by producing migration of dispersed phase within the phase mixture, said method comprising the steps of:

(1) introducing free charge that is net unipolar into said phase mixture, at least predominantly by electron emission which causes the continuous phase to act as a medium through which volumetric distribution of the introduced charge takes place, there being a sufficient excess of free charge introduced such that the volumetric charge distribution causes, in a vessel containing a quantity of the charged phase mixture, both an electric field to be induced in the mixture and the dispersed contaminant phase to become charged, and the induced electric field and the charge on the dispersed phase interact to produce an



electrical driving force acting on the dispersed phase so that said migration is due substantially to said driving force, the separation vessel, in a primary conglomerating region thereof, being free of internal collector surfaces within said phase mixture and having internal dimensions which are larger than the mean inter-contaminant spacing for the contaminant dispersed phase within the phase mixture, such that at least some conglomeration of the migrating contaminant phase will occur within the phase mixture in said primary conglomerating region; and

(2) allowing conglomeration of the migrating dispersed contaminant phase within said phase mixture to occur to a sufficient degree that conglomerations of contaminant phase are brought out of suspension in the phase mixture.

4,624,764

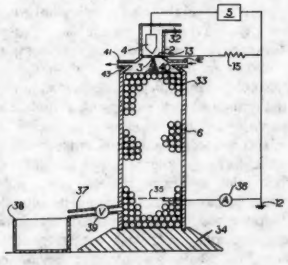
SEPARATION OF DISPERSED PHASE FROM CONTINUOUS FLUID PHASE

Donald J. Mintz, Summit, and Anthony M. Gleason, Westfield, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 17, 1984, Ser. No. 601,271

Int. Cl.[4] B03C *5/02*; C02F *1/48*; C10G *33/02*

U.S. Cl. 204—188 **24 Claims**



1. A method for use in the separation of a dispersed phase from a continuous liquid phase, the two phases together forming a phase mixture, by producing migration of dispersed phase within the phase mixture, said method comprising the steps of:

(!) introducing free charge that is net unipolar into said phase mixture, at least predominantly by electron emission which causes the continuous phase to act as a medium through which volumetric distribution of the introduced charge takes place, there being a sufficient excess of free charge introduced such that the volumetric charge distribution causes, in a vessel containing a quantity of the charged phase mixture, both an electric field to be induced in the mixture and the dispersed phase to become charged, and the induced electric field and the charge on the dispersed phase interact to produce an electrical driving force acting on the dispersed phase so that said migration is due substantially to said driving force; and

(2) allowing the migrating dispersed phase to accumulate within said phase mixture adjacent to at least one collector surface of dispersed phase collector means disposed within the vessel in contact with said phase mixture.

4,624,765

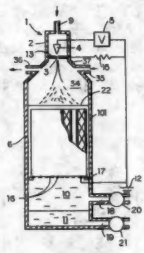
SEPARATION OF DISPERSED LIQUID PHASE FROM CONTINUOUS FLUID PHASE

Anthony E. Cerkanowicz, Livingston, and Robert J. L. Chimenti, Short Hills, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 17, 1984, Ser. No. 601,276

Int. Cl.[4] B03C *5/02*; C02F *1/48*; C10G *33/02*

U.S. Cl. 204—188 **28 Claims**



1. A method for use in the separation of a dispersed liquid phase from a continuous liquid phase, the two phases together forming a phase mixture, by producing migration of dispersed phase droplets within the phase mixture, said method comprising the steps of:

(1) introducing free charge that is net unipolar into said phase mixture, at least predominantly by electron emission which causes the continuous phase to act as a medium through which volumetric distribution of the introduced charge takes place, there being a sufficient excess of free charge introduced such that the volumetric charge distribution causes in a region containing a quantity of the charged phase mixture, both an electric field to be induced in the mixture and the dispersed phase to become charged, and the induced electric field and the charge on the dispersed phase interact to produce an electrical driving force acting on the dispersed phase so that said migration is due substantially to said driving force, and

(2) allowing the migrating dispersed phase to accumulate, within said phase mixture in said region, adjacent to collector means for dispersed phase comprising at least one collector element of porous material having a surface region exposed to the migrating dispersed phase droplets, said porous material having sufficient porosity as to absorb dispersed liquid phase into its pores and thereby trap dispersed phase at separate sites on said surface region for

promoting droplet coalescence and growth with further droplets undergoing electrically-driven migration to those sites.

4,624,766

ALUMINUM WETTABLE CATHODE MATERIAL FOR USE IN ALUMINUM REDUCTION CELL

Larry G. Boxall; William M. Buchta; Arthur V. Cooke, all of Baltimore; Dennis C. Nagle, Catonsville, and Douglas W. Townsend, Glen Burnie, all of Md., assignors to Commonwealth Aluminum Corporation, Bethesda, Md.

Division of Ser. No. 400,762, Jul. 22, 1982, Pat. No. 4,544,469.
This application Jul. 3, 1985, Ser. No. 752,442
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] C25C *3/08*; C25B *11/12*; C04B *35/00*; B29C *59/00*
U.S. Cl. 204—294 27 Claims

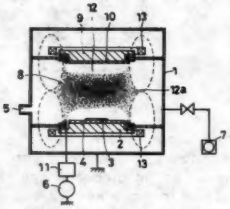
1. An aluminum wettable, cured, carbonized cathode material for use in a cell for the electrolytic reduction of alumina to aluminum comprising a Refractory Hard Material in a carbonaceous matrix comprising carbonaceous filler having a particle size less than 100 mesh and carbonaceous additive selected from the group consisting of carbon having a particle size greater than 100 mesh and carbon fiber and mixtures thereof bonded by a non-graphitized amorphous carbon, said matrix having a rate of ablation essentially equal to the rate of wear and dissolution of said Refractory Hard Material in the operating environment of said cell.

4,624,767

SPUTTER ETCHING APPARATUS HAVING A SECOND ELECTRICALLY FLOATING ELECTRODE AND MAGNET MEANS

Hisaharu Obinata, Hatano, Japan, assignor to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Filed Feb. 20, 1985, Ser. No. 703,369
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—298 3 Claims



1. A sputter etching apparatus comprising:
an evacuatible vacuum treatment chamber,
a sputter etching electrode mounted in said chamber for supporting a substrate to be etched,
means for evacuating said chamber,
means for introducing an etching gas into said evacuated chamber,
means for supplying electric power to said electrode for generating a plasms from said etching gas in said chamber,
an opposite electrode mounted in said chamber in an electrically floating condition facing said sputter etching electrode for confining the plasma in the space formed between said opposite electrode and said sputter etching electrode, said opposite electrode being electrically insulated from contact with said chamber and from direct connection with said means for supplying electric power, and
magnet means mounted in said chamber for generating a magnetic field which extends substantially perpendicularly to said opposite electrode and said sputter etching electrode and extends in an axial direction along a peripheral open region surrounding said space so that the plasma is confined in said space.

4,624,768

ELECTROPHORESIS APPARATUS

Motoko Yoshida, Chofu; Michio Itoh, Kokubunji, and Kunihiro Maeda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,006
Claims priority, application Japan, Jan. 25, 1984, 59-10034
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—299 R 3 Claims

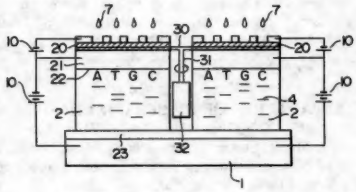
1. A horizontal electrophoresis apparatus which comprises a supporting matrix for electrophoresis, a cooling plate formed of sintered SiC for supporting said matrix, and a peltier element for cooling said cooling plate; said sintered SiC comprising mainly alpha-type SiC and containing 0.1 to 3.5 wt. % of beryllia or boron nitride.

4,624,769

ELECTROPHORESIS APPARATUS FOR NUCLEIC ACID FRAGMENTS

Tamotu Simada, Akishima; Yoshinori Harada; Hideki Kambara, both of Hachioji; Keiichi Nagai, Tokyo, and Jirou Tokita, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,778
Claims priority, application Japan, Jun. 29, 1984, 59-132876
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—301 10 Claims



1. An improved electrophoresis apparatus for nucleic acid fragments in which nucleic acid fragments are separated in the order of their molecular weight in an electrophoresis cell using an electrophoretic gel for determining the base sequence of the nucleic acid, the supply of nucleic acid fragments including ingredients of higher molecular weight than the molecular weight of nucleic acid fragments to be separated in the electrophoresis cell, the improvement comprising a nucleic acid fragment specimen supply section for supplying nucleic acid fragments to said electrophoresis cell, disposed over a molecular sieving membrane having molecular permeability such that those higher molecular weight ingredients in the nucleic acid fragment specimen, other than the fragments intended to be analyzed electrophoretically, are removed, the nucleic acid fragment specimen supply section comprising at least one electrophoresis cell each having a milecular sieving membrane composed of a molecular sieving membrane, having a disc shape, divided into at least two sections each with a sector configuaration having a sufficient size to cover the upper

surface of the electrophoresis cell, and a rotational mechanism disposed to the center of the molecular sieving membrane to constitute a structure capable of replacing the molecular sieving membrane by rotating the molecular sieving membrane each by an angle of center corresponding to the sector configuration at an arbitrary time interval.

4,624,770
AIR-FUEL RATIO SENSOR

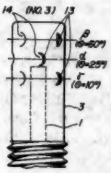
Tetsusyo Yamada; Takao Kojima; Hiroyuki Ishiguro, and Yutaka Nakayama, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed May 16, 1985, Ser. No. 734,602

Claims priority, application Japan, Jun. 26, 1984, 59-130145; Jun. 26, 1984, 59-130146

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—428 **10 Claims**



1. An air-fuel-ratio sensor, comprising a mounting body; a sensor unit extending away from a top of the mounting body and having an oxygen pump with a wall means formed at an extended tip of the sensor unit, said oxygen pump having an oxygen-ion-conductive solid electrolyte plate with a pair of electrodes secured to opposite surfaces thereof, said wall means facing one of said electrodes and being parallel thereto and spaced therefrom at a small spacing so as to define a diffusion-restricting narrow gap therebetween; and a cup-shaped protector having a closed end and a side wall, said protector being secured to said mounting body to enclose said sensor unit therein, said side wall of said cup-shaped protector having at least two rows of holes extending therethrough, said rows spaced axially along the longitudinal axis of said cup-shaped protector, and deflectors secured to the edges of the holes and extending inwardly of the protector at acute angles relative to the inner surface of the side wall of the protector, the angles of said deflectors in each row being greater than the angles of the deflectors in a preceding row in a direction along the longitudinal axis of said protector and toward said closed end, wherein said holes and said deflectors are such that gas outside the protector flows into the protector through said holes in a swirling motion, and the amount of said swirling gas in the protector increases with the axial distance from the mounting body.

4,624,771
FLUID CATALYTIC CRACKING OF VACUUM RESIDUUM OIL

Philip A. Lane, Port Arthur; Charles H. Schrader, Groves; Glenn A. Clausen, Nederland, and David E. Self, Port Neches, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 18, 1985, Ser. No. 777,146

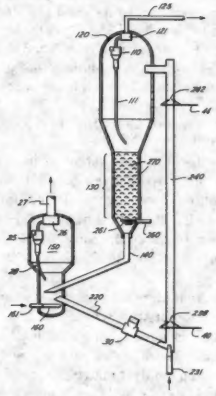
Int. Cl.[4] C10G *11/18, 51/02*

U.S. Cl. 208—74 **10 Claims**

7. A method of cracking a vacuum residuum fraction to produce gasoline and lower boiling products which comprises:

a. contacting a vacuum gas oil with a fluidized cracking catalyst for a contacting time of 0.5 to 1.5 seconds, said cracking catalyst at an initial contacting temperature of about 1000° to 1200° F.;

b. contacting said fluidized cracking catalyst and vacuum gas oil with a vacuum residuum fraction for a contacting time of about 0.2 to 0.6 seconds;



c. separating said cracking catalyst from cracked products of said vacuum residuum fraction and said vacuum gas oil.

4,624,772
CLOSED REACTOR FCC SYSTEM WITH PROVISIONS FOR SURGE CAPACITY

Frederick J. Krambeck, Cherry Hill, and Klaus W. Schatz, Skillman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 529,824, Sep. 6, 1983, Pat. No. 4,579,716. This application Nov. 8, 1985, Ser. No. 796,132

Int. Cl.[4] C10G *57/00, 11/18*

U.S. Cl. 208—95 **22 Claims**

22. A process for the fluid catalytic cracking of a hydrocarbon feed in a closed cyclone system, comprising the following steps:

introducing a suspension of hydrocarbon feed and catalyst into a riser conversion zone defined by a vertically disposed elongated tubular conduit having an upstream end and a downstream end, said downstream end terminating within a reactor vessel;

discharging a mixture of the catalyst and cracked hydrocarbon product from the downstream end thereof;

passing said discharged mixture through a first conduit to a primary cyclone, wherein said first conduit is attached to said downstream end and said primary cyclone;

passing said mixture from said primary cyclone to a secondary cyclone connected to said primary cyclone by a second conduit, said first and second conduits completely separating said mixture conducted therein from the atmosphere of said reactor vessel;

providing said second conduit with a surge capacity means for accommodating a sudden 2- to 20-fold increase above a steady state rate of flow of said mixture within said second conduit, said surge means being substantially closed during a steady state rate of flow of said material within said second conduit, said second surge means preventing catalyst flow therethrough when said second surge means is substantially closed and allowing stripping gas flow therethrough when said second surge means is substantially closed;

passing a portion of said catalyst from said cyclones to a catalyst stripping zone; and

stripping entrained hydrocarbons from said portion of catalyst in said catalyst stripping zone.

4,624,773

LARGE PORE CATALYSTS FOR HEAVY HYDROCARBON CONVERSION

William P. Hettinger, Jr., Russell, Ky., and James E. Lewis, Dublin, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 523,811, Aug. 16, 1983, Pat. No. 4,536,281, which is a division of Ser. No. 318,186, May 5, 1981, Pat. No. 4,431,749, which is a continuation of Ser. No. 318,185, May 28, 1981, abandoned. This application Sep. 4, 1984, Ser. No. 647,193

Int. Cl.[4] C10G *11/05*

U.S. Cl. 208—120 7 Claims

1. A process for the catalyst cracking of a hydrocarbon feedstock containing at least ten percent heavy hydrocarbon components boiling above 1025° F. comprising: contacting said feedstock with a catalyst, wherein said catalyst is made by dispersing carbon black comprising primary reticulated particles having length of about 500 to 30,000 angstroms into a slurry comprising:

A. solids of a crystalline aluminosilicate having hydrocarbon cracking characteristics wherein at least a portion of said carbon black is added before at least a portion of said crystalline aluminosilicates have formed; and

B. precursors of a catalyst matrix; processing said mixture to form solid shapes of hydrocarbon cracking catalyst containing said carbon black particles in a matrix formed from said precursors of said catalyst matrix; and heating said solid catalyst shapes in the presence of an oxygen containing gas under combustion conditions sufficient to remove said carbon black particles and provide large feeder pores in said catalyst shapes, in a reaction zone maintaned under hydrocarbon cracking conditions providing cracked hydrocarbon products and depositing coke on said catalyst, stripping said cracked hydrocarbon products from said catalyst, regenerating said catalyst under oxidizing conditions sufficient to remove at least a portion of said deposited coke from said catalyst, and returning said regenerated catalyst to said reaction zone.

4,624,774

CATALYTIC CRACKING OF USING CATALYST PRODUCED BY NOVEL PROCESS HYDROCARBONS

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 493,192, May 10, 1983, Pat. No. 4,576,805, which is a continuation-in-part of Ser. No. 412,362, Aug. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 333,369, Dec. 22, 1981, abandoned. This application Jan. 8, 1986, Ser. No. 818,966

Int. Cl.[4] C10G *11/05*

U.S. Cl. 208—120 27 Claims

15. A process for converting a feedstock comprising hydrocarbon compounds to converson product comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at cracking conditions with a catalyst composition comprising a crystalline composition prepared by a method for enhancing the catalytic activity of a porous inorganic crystalline composition comprising 98 mole percent or more SiO_2 and 2 mole percent or less oxides of at least one initial lattice metal selected from those of Groups IIIB, IVB, VB, VIB, VIIB, VIII, IIIA, IVA and VA of the Periodic Table of the Elements and having an anhydrous anionic framework molar composition expressed by the formula

$$(1-x)SiO_2:(x)MO_{n/2}$$

wherein x is less than or equal to 0.02, M is said initial lattice metal and n is the valence of M, said crystalline composition having a total cation exchange capacity of less than about 0.7 meq/gram, which method comprises the steps of

calcining said crystalline composition at a temperature of from about 200° C. to about 600° C.,

contacting said calcined crystalline composition at a temperature of from about 100° C. to about 850° C. with a volatile compound comprising at least one metal to be tetrahedrally coordinated in the framework of said crystalline composition for a time sufficient to increase the total amount of tetrahedrally coordinated lattice metal in the framework of said crystalline composition whereby said total amount is greater than the amount of said initial lattice metal prior to said contacting, said volatile compound comprising said metal having a radius ratio of less than 0.6 and a size and shape which permits said volatile compound to enter the pores of said crystalline composition at the contacting temperature and

converting said volatile compound contacted crystalline composition to the hydrogen or hydronium form.

4,624,775

PROCESS FOR THE PRODUCTION OF PREMIUM COKE FROM PYROLYSIS TAR

Eric M. Dickinson, Bay Village, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 22, 1984, Ser. No. 663,495

Int. Cl.[4] C10G *9/14*

U.S. Cl. 208—131 7 Claims

1. A process for producing premium coke comprising the steps:

(a) blending between about 60 and about 90 weight percent pyrolysis tar and between about 10 and about 40 weight percent coal tar distillate to form a mixture; and

(b) coking said mixture.

4,624,776

SELECTIVE REMOVAL OF COKE PRECURSORS FROM HYDROCARBON FEEDSTOCK

Robert B. Long, Atlantic Highlands, N.J., and Jack Griffel, Sarnia, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 587,827, Mar. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 501,196, Jun. 6, 1983, abandoned. This application Sep. 6, 1985, Ser. No. 773,050

Int. Cl.[4] C10G *25/00*

U.S. Cl. 208—302 11 Claims

1. A process for selectively removing a major portion of the coke precursors from atmospheric and vacuum residuum having a Conradson carbon residue of at least about 10 wt.% which process comprises:

(a) contacting said resid with an adsorbent which has a major portion of its surface area in pores greater than 50 Angstroms in diameter and in an amount such that the ratio of adsorbent to polars in the feed is no greater than 30 to 1, for a period of time sufficient to adsorb a major portion of said coke precursors onto said adsorbent,

(b) contacting the adsorbent resulting from step (a) with at least one solvent having an overall Hildebrand solubility parameter from about 8 to 9 and a complexing solubility parameter of 1.3 or less for a period of time sufficient to desorb a coke presursor depleted fraction, and

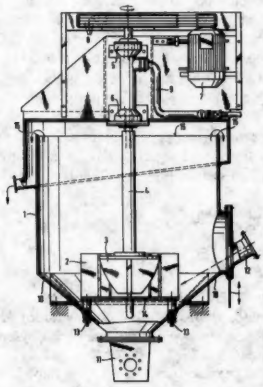
(c) contacting the adsorbent resulting from step (b) with at least one solvent having an overall Hildebrand solubility parameter from about 10 to about the value wherein the solvent is immiscible with the resulting coke precursor rich fraction and a complexing solubility parameter greater than 1.3% for a period of time sufficient to desorb a coke precursor rich fraction which contains a major portion of the coke precursors present in said resid.

4,624,777

FLOTATION MACHINE

Jouko O. Kallioinen; Tauno J. Vähäsarja, and Arvo Repo, all of Outokumpu, Finland, assignors to Outokumpu Oy, Espoo, Finland

Filed Nov. 15, 1984, Ser. No. 671,671
Claims priority, application Finland, Nov. 18, 1983, 834245
Int. Cl.[4] B03D *1/16, 1/20, 1/24*
U.S. Cl. 209—170 10 Claims



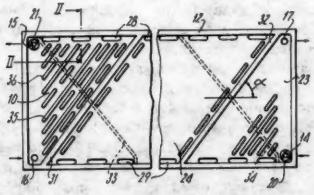
1. A flotation machine for separating coarse particles from sludges, comprising a flotation cell and a mixer, the flotation cell having a side wall, a bottom wall, an outlet connection for withdrawing material containing coarse particles from the cell, said outlet connection being formed in the bottom wall of the cell, and at least one inlet connection for introducing the sludge to be treated, add the mixer including a stator substantially imperforate stator bottom plate and a rotor located above said bottom plate, the mixer being disposed in the flotation cell with the bottom plate spaced from the bottom wall of the cell and located over the outlet connection and being surrounded laterally in the flotation cell by a washing zone that is substantially free of obstruction, the inlet connection of the cell being disposed laterally outwards of the mixer and being arranged so that sludge entering the cell passes laterally towards the mixer, and the machine also comprising means for introducing gas under pressure into the flotation cell at a location that is the vicinity of the mixer.

4,624,778

SPACER FOR MEMBRANE APPARATUS

Christian Clermont, Anse; Marc de Moncuit, and Jacques Gauckler, both of Lyons, all of France, assignors to Hospal Industrie, Meyzieu, France

Filed Oct. 24, 1983, Ser. No. 544,999
Claims priority, application France, Oct. 28, 1982, 82 18371
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.3 24 Claims



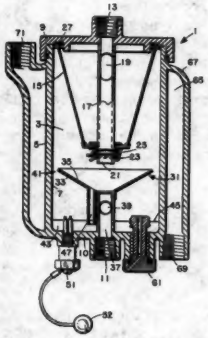
1. A spacer for a device for exchanging heat and/or material between fluids through at least one membrane supported by the said spacer, the spacer comprising a solid plate having a pair of opposed, major faces, on each face of which is defined an exchange zone extending longitudinally between a distribution zone and a collection zone for one of the fluids, means for ensuring peripheral leaktightness, the said exchange zone being divided on at least one of the faces of the said solid plate into separate compartments by at least one continuous transversal rib whose two ends are connected to the said means for ensuring peripheral leaktightness, the said rib forming a leaktight baffle which channels and directs on one side the fluid flowing between the face of the said spacer and the adjacent membrane into a least one longitudinal cavity aligned within the longitudinal edge of the spacer.

4,624,779

FUEL TREATMENT APPARATUS

Erwin E. Hurner, 320 Eighth Ave., W., West Fargo, N. Dak. 58078

Filed Sep. 10, 1985, Ser. No. 774,285
Int. Cl.[4] B01D *35/18*
U.S. Cl. 210—180 9 Claims



1. A fuel treatment apparatus comprising:

means defining a settling chamber having an inlet in a bottom portion thereof and an outlet in an upper portion thereof and a wall at the lateral perimeter thereof;

a filter-separator between said inlet and said outlet through which said fluid must pass to reach said outlet;

a downwardly pointed conical spreader above said inlet generally centrally disposed within said chamber, but spaced from said outer wall with an upper surface and a lower surface, said fluid being spread about said lower surface and flowing through the space between said spreader and said wall;

a water collection zone in a bottom section of said chamber below said conical spreader;

said upper surface of said conical spreader forming a catcher to catch moisture dropping from said filter-separator;

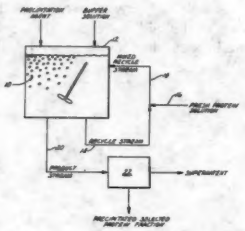
means to permit moisture on said upper surface to flow through said conical spreader and into said water collection zone; and

drain means to permit drainage of water from said collection zone.

4,624,780
FRACTIONATION OF BLOOD PLASMA

Chong E. Chang, La Canada, Calif., assignor to Alpha Therapeutic Corporation, Los Angeles, Calif.

Division of Ser. No. 393,030, Jun. 28, 1982, Pat. No. 4,486,341.
This application Apr. 19, 1984, Ser. No. 601,841
Int. Cl.[4] B01D *36/00*
U.S. Cl. 210—195.1 4 Claims

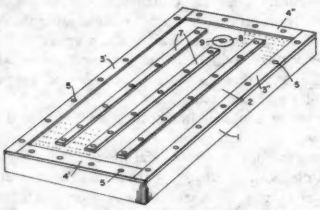


1. Apparatus for separating a protein fraction from a solution containing proteins, the apparatus comprising:
(a) individual supply containers for a precipitation agent, a buffer solution, and a solution containing proteins;
(b) a suspension tank for a suspension containing protein particles precipitated from the protein solution;
(c) means for conveying the precipitation agent from its container directly into the suspension tank; [illegible](d) means for conveying the buffer solution from its container directly into the suspension tank;
(e) recycle means comprising a recycle line connected at one end to the suspension tank for withdrawing the protein particle suspension from the tank and connected at its other end to the suspension tank for introducing the protein particle suspension back into the tank;
(f) means for conveying the protein solution from its container to the recycle line for introducing the protein solution into the protein particle suspension flowing in the recycle line; and
(g) means for conveying the protein particle suspension from the suspension tank to a separating means for separating the suspension into a precipitated protein particle fraction and a supernatant.

4,624,781
AIR DIFFUSION DEVICE FOR AERATING WATER WITH SMALL BUBBLES

Rudolf Messner, Laufer Mühle, D-8551 Adelsdorf, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,587
Claims priority, application European Pat. Off., Aug. 16, 1984, 84109756.1
Int. Cl.[4] C02F *7/00, 3/20*
U.S. Cl. 210—220 11 Claims

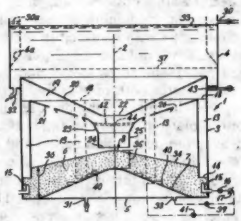


1. An air diffusion device, comprising:
a solid plate including an upper major surface having a perimeter with a predetermined width and a predetermined length;
a perforated air diffusion foil sheet having a length and a width at least as great as said predetermined length and said predetermined width, respectively, of said plate, said foil sheet overlying said major surface;
first securing means for securing said foil sheet, at the perimeter of said major surface of said plate, to said plate in an airtight manner such that a chamber is formed between said foil sheet and said plate major surface;
second securing means, disposed within the perimeter of said plate major surface and atop the foil sheet, for securing said foil sheet directly therebeneath to said plate, said second securing means being spaced from said first securing means to permit communication between all points of said chamber; and
air supply means for supplying air to said chamber,
whereby air supplied to said chamber at a single location communicates with the entire chamber.

4,624,782
FILTERING APPARATUS

Michael H. Gould, Belfast, Ireland, assignor to National Research Development Corporation, London, England

Filed Dec. 27, 1984, Ser. No. 686,672
Claims priority, application United Kingdom, Dec. 29, 1983, 8334550
Int. Cl.[4] B01D *23/10, 23/24*
U.S. Cl. 210—268 6 Claims



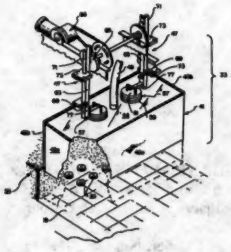
1. Filtering apparatus comprising:
a vessel, disposed about a vertical axis;
supporting surface within said vessel, said supporting surface spanning said vessel and sloping downwardly away from the axis and being adapted to support a bed of particulate filtering medium;
backwashing conduit means, regularly disposed around the periphery of said vessel; and
water jets associated with said backwashing conduit means, by means of which backwashing conduit means and water jets said medium may simultaneously be recirculated from a lower part to an upper part of said bed and be washed within said backwashing conduit means as it is recirculated, said apparatus further including a plurality of water nozzles mounted on said supporting surface with said water nozzles being aimed radially-outwardly away from said axis so that water discharged by said nozzles will help move said medium radially-outwardly toward said backwashing conduit means during backwashing, said supporting surface being formed with a plurality of perforations to allow filtrate to pass, the extent of said perforations changing progressively with increasing radius away from said axis, being greatest in the vicinity of said periphery of said vessel so as to promote even flow of said filtrate through said bed across its entire plan area.

4,624,783

APPARATUS FOR GRANULAR MEDIA FILTER

Brent C. Black; Bruce D. Bradley, and Ralph B. Haymore, all of Salt Lake City, Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 22, 1985, Ser. No. 693,435
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—271 15 Claims



1. Apparatus for removing used filter media of a liquid filtering machine and replacing it with clean filter media, while at the same time enabling the machine to filter liquid, the filtering machine being of the type comprising a tank and at least one continuous bed of granular filter media in the tank free of fixed partition members dividing the bed into predetermined sections, and through which liquid having suspended solids therein flows for removing the solids to clean the liquid, but with the result that the filter media retains solids therein and over time is rendered unsuitable for further filtering of the liquid; said apparatus comprising:

(a) partitioning chamber means and a carriage mechanism for selectively supporting and conveying the chamber means above the granular filter media bed, the chamber means being selectively insertable through a range of positions into the bed to isolate one section of the bed from the remainder of the bed;

(b) means to selectively allow insertion of said partitioning chamber means into the bed and removal of said chamber means from the bed; and

(c) means in communication with the interior of said partitioning chamber means for removing substantially the entire volume of the filter media in the chamber means which has retained solids therein from the chamber means and for delivering clean filter media to the chamber means while filtration may proceed unimpeded in the remainder of the bed.

4,624,784

APPARATUS INCLUDING A FLOW PATH FORMED BY MEMBRANE COMPRESSION

Michel S. Lefebvre, New South Wales, Australia, assignor to Memtec Limited, Australia

PCT No. PCT/AU81/00126, § 371 Date Apr. 28, 1982, § 102(e) Date Apr. 28, 1982, PCT Pub. No. WO82/00775, PCT Pub. Date Mar. 18, 1982
Continuation of Ser. No. 375,139, Apr. 28, 1982, abandoned.
This PCT application Sep. 3, 1981, Ser. No. 679,613
Claims priority, application Australia, Sep. 3, 1980, PE5372
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.1 8 Claims

1. Cross-flow filtration apparatus for removing a preselected component from a fluid feedstock, which comprises:

a first plate member having a plurality of closely spaced fixed projections, said projections having tips that are in a first plane;

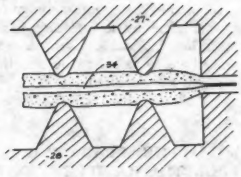
a second plate member having a plurality of closely spaced fixed projections, said projections of said second plate member having tips that are in a second plane;

means supporting said first and second plate members in a fixed, spaced relationship to each other with the projections of said first plate member facing and in a fixed relationship to the projections of the second plate member;

first and second compressible, resilient membranes of sheet material through which the preselected component can pass, each of said membranes having a first surface and an opposite surface;

said first membrane having its first surface thereof in contact with the first surface of said second membrane when there is no flow of feedstock;

said first membrane having its opposite surface in contact with the projections of said first plate member and said second membrane having its opposite surface in contact with the projections of said second plate member;



said supporting means for said first and second plate members maintaining said first and second planes at a fixed distance from each other that is no greater than the non-compressed combined thickness of said first and second membranes located between said first and second planes;

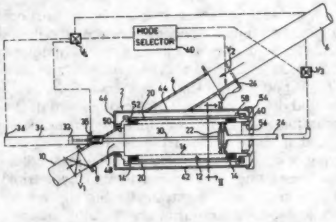
inlet means for introducing pressurized feedstock into the apparatus and between the first and second membranes to force the compressible, resilient menbranes themselves to become compressed against the fixed projections of said first and second plate members by the pressurized feedstock passing through the apparatus, and thus separate the membranes from each other as a result of the distance between the first and opposite surfaces of each membrane becoming smaller due to compression, to form a feedstock flow path between the membranes.

4,624,785

EASILY-CLEANABLE FILTERS

Mordeki Drori, 89 Zahal Street, Kiron, Israel

Filed Sep. 4, 1984, Ser. No. 647,094
Claims priority, application Israel, Sep. 2, 1983, 69638
Int. Cl.[4] B01D *29/46*
U.S. Cl. 210—414 3 Claims



1. A filter including a housing having an inlet, an outlet, and a dirt-purging opening;

a plurality of circular filter discs in said housing with each disc being formed with a central opening, and all the discs being disposed in a stack with the side faces of adjacent discs contacting each other for filtering the fluid flowing through the housing from its inlet to its outlet;

a pair of end rings at the opposite ends of said stack of filter

discs and of larger outer diameter than said filter discs, said end rings being formed with a plurality of openings therethrough around a circle of larger diameter than said filter discs;

a circular array of axially-extending rods passing through said openings in said end discs and circumferentially-spaced from each other;

the outer surfaces of said filter discs constituting upstream side of the filter discs and facing said housing inlet and dirt-purging opening, and the inner surfaces of said filter discs defined by their central openings constituting the downstream side of the filter stack and facing said housing outlet;

and a cleaning nozzle movable axially within said central openings of the filter discs for cleaning the filter disc stack, said cleaning nozzle including means for connecting it to a pressurized source of the fluid to be filtered for blowing out the filtered particles from between the filter discs in the stack through said circumferential spaces between the axially-extending rods and said dirt-purging opening, said cleaning nozzle also including means for outletting a fluid jet eccentric to the axis of the nozzle so as to rotate the nozzle by the reaction force applied thereto by said eccentric jet.

4,624,786

APPARATUS FOR SEPARATING THE LIQUID PORTION FROM THE SOLID PORTION OF A CERAMIC SLIP

Dietrich Schlegel, Karlstrasse 30, 5100 Aachen, Fed. Rep. of Germany

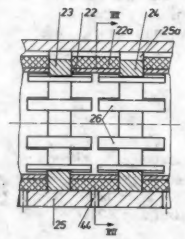
PCT No. PCT/DE84/00068, § 371 Date Nov. 13, 1984, § 102(e) Date Nov. 13, 1984, PCT Pub. No. WO84/03660, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 23, 1984, Ser. No. 682,358

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3311054

Int. Cl.[4] B01D *25/02*

U.S. Cl. 210—414 **4 Claims**



1. An apparatus for separating the liquid portion from the solid portion of a liquid, finely dispersed material, in particular a ceramic slip, said apparatus having an internal pressure resistant cylindrical housing, a driven worm mounted therein, means for supplying the slip at one end of the housing and a narrow solid discharge throat at the other end of the housing, said apparatus characterized in that a filter means is mounted within said housing and surrounds the worm, said housing supporting said filter means against radial pressure and anchor means securing said filter means to said cylindrical housing against rotation, said filter means having slip trapping means on its inner face for capturing and holding stationary a thin layer of the slip between it and the adjacent face of said worm thereby forming a smooth surface of reduced abrasive effect surrounding said worm, against which the worm can move the slip both axially and radially of the worm chamber with reduced resistance to axial movement, said layer being thin enough to permit liquid filtrate to pass through it, said filter means including a plurality of cylindrical sections, a ring element seated between each pair of adjacent sections and concentric therewith, said slip trapping means including plates secured to said ring elements and protruding radially inwardly beyond the inner faces of said cylindrical sections and axially over portions of the inner faces of said cylindrical sections for trapping the layer of slip, a plurality of axially spaced grooves communicating with said filter member for receiving filtrate separated from the slip, a filtrate discharge port, said grooves communicating with said port.

4,624,787

LIFTING MECHANISM FOR SEDIMENTATION DEVICE

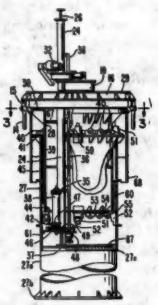
Ralph B. Haymore, and Heinz W. Winter, both of Salt Lake City, Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 490,741, May 2, 1983, Pat. No. 4,515,694. This application May 6, 1985, Ser. No. 731,172

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.[4] B01B *21/18*

U.S. Cl. 210—531 **10 Claims**



1. A lifting mechanism for a raking structure in a solids-liquid separation tank comprising:

a fixed column adapted to extend vertically within the tank;

a movable column in telescoping relationship with said fixed column, said movable column being adapted to support a raking structure for the tank;

means for raising and lowering said movable column telescopically with respect to said fixed column comprising;

an elongate flexible tension member;

a first series of load points on the fixed column at spaced intervals on the fixed column;

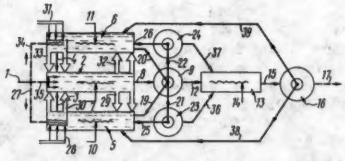
a second series of lift points on the movable column below said first series of points and at spaced intervals on the movable column, the tension member being alternately threaded between load and lift points of said first and second series of points, with the tension member thus being led over one of said load points, down and below one of said lift points and back up and over the next load point; and

means for selectively pulling and paying out said tension member for drawing the lift points up toward the load points for raising the movable column, and for allowing the lift points to move down away from the load points for lowering the movable column, respectively.

4,624,788
METHOD OF BIOLOGICAL PURIFICATION OF WASTE WATER

Boris N. Repin, Stremyanny pereulok, 17/21, kv. 58, Moscow, U.S.S.R.

Filed Dec. 19, 1984, Ser. No. 683,911
Int. Cl.⁴ C02F 3/12
U.S. Cl. 210—607 **6 Claims**



1. A method of biological purification of waste water by removing organic impurities therefrom by activated sludge in two successive stages, the first stage having a starting and an end zone said method comprising the steps of:

mixing in the starting zone, incoming waste water with activated sludge to obtain a sludge medium;

aerating the thus obtained sludge medium during passage from the starting zone to the end zone;

separating recyclable sludge and sludge water from said sludge medium in the end zone of the primary purification stage;

dividing said separated recyclable sludge into two portions of which the first portion is conveyed for regeneration;

compacting the second portion of recyclable sludge to increase its concentration;

mixing the second portion of recyclable sludge after compaction with the first portion of recyclable sludge conveyed for regeneration in a regeneration zone;

regenerating said mixed first and second portions of recyclable sludge to obtain regenerated activated sludge;

feeding the regenerated activated sludge to said starting zone of the primary purification stage for mixing with the incoming waste water being purified while maintaining in said primary purification stage a continuity in the ratio between organic impurities brought in by the incoming waste water and activated sludge; and

conveying sludge water separated in the primary purification stage to the secondary purification stage;

the secondary purification stage comprising the steps of:

aerating sludge water conveyed to the secondary purification stage; and

separating residual activated sludge therefrom.

4,624,789
MASS TRANSFER INTO POROUS GRANULES USING STRATIFIED SEMIFLUIDIZED BEDS

Liang-tseng Fan, and Alexander P. Mathews, both of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

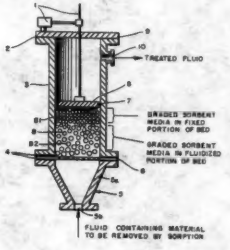
Filed Mar. 18, 1985, Ser. No. 713,252
Int. Cl.⁴ B01D 15/02, 53/12
U.S. Cl. 210—661 **10 Claims**

1. The stratified semifluidized bed method of transferring a component from a fluid into porous granules internally active for removal thereof, wherein a bed of said granules is confined within an upwardly-extending treatment zone, said zone having inlet means in the lower portion thereof for introducing a fluid below said bed at selected fluidizing velocities and perforated plate means extending across the upper portion of said zone for fluid exit therethrough, comprising the steps of:

(a) employing as said semifluidized bed a mixture of said porous granules which contains effective amounts of both relatively small and relatively large granules;

(b) preparing said bed for removal of said component by stratifying said bed with the smaller size granules concentrated in the bed upper portion and the larger size granules concentrated in the bed lower portion;

(c) packing at least part of said stratified smaller granules against said plate means to form a packed bed portion with a fluidized bed portion therebeneath containing said relatively larger granules, said packed bed portion containing from 5 to 50% by weight of the total bed granules; and

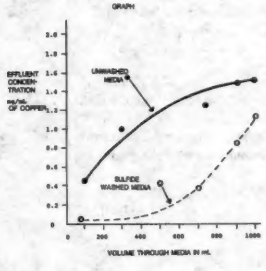

TREATED FLUID
GRADED SORBENT MEDIA IN FIXED PORTION OF BED
GRADED SORBENT MEDIA IN FLUIDIZED PORTION OF BED
FLUID CONTAINING MATERIAL TO BE REMOVED BY SORPTION

(d) thereafter passing upwardly through said bed said component-containing fluid at a velocity sufficient to maintain said bed in a stratified semifluidized condition as said component is removed therefrom into the fluidized larger granules and successively into the packed smaller granules.

4,624,790
REDUCTION OF METAL CONTENT OF TREATED EFFLUENTS

David R. Kamperman, Harmony; Leslie E. Lancy, Ellwood City, and Claire A. Swank, Butler, all of Pa., assignors to Lancy International, Inc., Zelienople, Pa.

Filed Nov. 19, 1981, Ser. No. 322,998
Int. Cl.⁴ C02F 1/64
U.S. Cl. 210—665 **10 Claims**

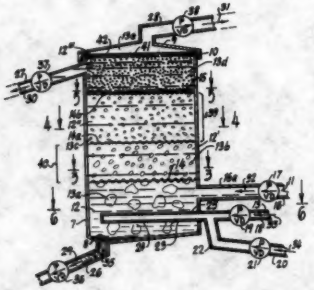


1. An improved waste treatment process that has a broad range of effectiveness from the standpoint that it is effective irrespective of the nature of and variations in the dissolved metal content in a waste solution effluent that has a tightly chelated dissolved metal content therein which comprises, first providing the effluent with a pH of at least 9.0 and with a soluble sulfide or polysulfide compound therein, then providing at least 1 mg/l of an unchelated soluble heavy metal salt in the effluent and reacting it with the sulfide compound to preliminarily provide a seed and then effect an accelerated sulfide reaction with the dissolved heavy metal content of the effluent, and effectively converting the then soluble heavy metal content without preference into insoluble heavy metal sulfide.

4,624,791
METHOD FOR IMPROVING BUBBLE SURFACE AREA EXPOSURE

Jon S. Ferriss, P.O. Box 221, Whitehouse Station, N.J. 08889

Filed Jul. 15, 1985, Ser. No. 754,954
Int. Cl.[4] C02F 1/24, 1/72, 1/76
U.S. Cl. 210—704 12 Claims

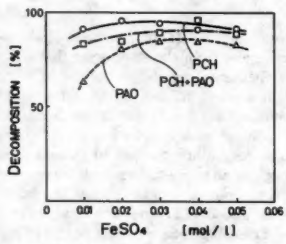


1. A method for increasing bubble-production of gas bubbled upwardly through a first liquid composition consisting essentially of a major amount of water relative to lesser total amounts of other liquids and solids within a container vessel in an amount sufficient to permit upward movement of bubbles therethrough, the improvement consisting essentially of placing said liquid into said container vessel, thereafter placing at least two substantially horizontal first and second spaced-apart screens within the liquid at locations spaced a substantially large distance below an upper surface of the liquid sufficiently below said upper surface such that optimally a major amount of surface area contact is obtained by the composition with bubbles produced at said locations by a gas passed upwardly through the screens, placing the second screen at least about ½ inch for lower mesh size thereof down to about ¼ inch for higher mesh size thereof above the first screen, utilizing as said first and second screens, screens each having mesh size within a range of from about 25×25 mesh to about 4×4 mesh, U.S. Standard Mesh, and bubbling the gas upwardly through the liquid composition from a plurality of gas outlets located within said container vessel below the first screen from a point within or below the liquid.

4,624,792
METHOD FOR TREATING RADIOACTIVE ORGANIC WASTES

Akihiro Yamanaka; Masami Toshikuni, and Kazunori Suzuki, all of Yokohama, Japan, assignors to JGC Corporation, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,370
Int. Cl.[4] C02F 1/72
U.S. Cl. 210—759 6 Claims



1. A method for treating radioactive organic wastes containing anionic exchange resins which comprises decomposing the wastes by oxidizing treatment with at least 2 gr/hour of hydrogen peroxide per gr of waste at a temperature below 100° C. with a catalyst system comprising (a) salts containing ferrous or ferric ions at a concentration of 0.01 to 0.05 moles per liter and (b) an organic cation exchange resin in an amount of at least 1% by weight based on the organic solid wastes to be decomposed.

4,624,793
FIBER FINISHES

John E. Phifer, Woodruff; Charles R. Tucker, Spartanburg, and Roger H. Garst, Greer, all of S.C., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jun. 20, 1984, Ser. No. 622,360
Int. Cl.[4] D06M 13/32
U.S. Cl. 252—8.6 7 Claims

1. An aqueous composition useful as a fiber finish for polypropylene fibers, filaments and yarns, said aqueous composition being essentially a clear liquid homogeneous solution having a 25° C. kinematic viscosity from about 100 to 200 centistokes, consisting essentially of:

(a) 30 to 90 weight percent α-alkyl-Ω-hydroxypoly (oxyethyl-ene) produced by condensation of 1 mole of C_{11-15} straight-chain randomly substituted secondary alcohols with an average of 7 to 20 moles of ethylene oxide;

(b) 5 to 60 weight percent ethoxylated alcohol phosphate ester selected from the group consisting of α-dodecyl-Ω-hydroxypoly(oxyethyl-ene) mixture of dihydrogen phosphate and monohydrogen phosphate esters that have an acid number to pH 5.2 of 103–111 and that are produced by the esterification of the condensation product of 1 mole of n-dodecyl alcohol with 4–4.5 moles of ethylene oxide and α-tridecyl-Ω-hydroxypoly(oxyethyl-ene) mixture of dihydrogen phosphate and monohydrogen phosphate esters that have an acid number to pH 5.2 of 75–85 and that are produced by the esterification of the condensation product of one mole of "oxo" process tridecyl alcohol with 5.5–6.5 moles of ethylene oxide, and neutralized with essentially a stoichiometric amount of potassium hydroxide; and

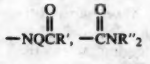
(c) 0.5 to 25 weight percent water.

4,624,794
COMPOSITIONS AND PROCESS FOR TREATING TEXTILES

David J. Cooke, Pentyrch; Brian J. Griffiths, Coytrahen; Vivian B. John, and George C. Sawicki, both of Penarth, all of England, assignors to Dow Corning, Ltd., Barry, Wales

Filed May 24, 1985, Ser. No. 737,592
Claims priority, application United Kingdom, Jun. 2, 1984, 8414113
Int. Cl.[4] D06M 11/00
U.S. Cl. 252—8.8 17 Claims

1. A textile-treating composition which comprises (A) a cationic surfactant which is substantive to water rinse on textile fabrics and (B) a polydiorganosiloxane having in the molecule at least one silicon-bonded group —RX wherein R represents an alkylene group having from 1 to 8 carbon atoms, which may have oxygen or sulphur atoms present in the carbon chain, and X represents an amido-containing organic group selected from



and $-[NZ(CH_2)_n]_pNZ(CH_2)_nNZQ$ wherein R' represents a hydrogen atom, an alkyl group having from 1 to 20 carbon atoms, an alkenyl group or an aryl group, each R" represents a hydrogen atom, an alkyl group having from 1 to 18 carbon

atoms or an aryl group, Q represents an alkyl group or a hydrogen atom, each Z represents a hydrogen atom, a lower alkyl group or an

group, wherein R' is as hereinabove defined, at least one Z being a

group, n is an integer of from 2 to 6 and p has a value of 0, 1 or 2, at least 50 percent of the total silicon-bonded substituents in the polydiorganosiloxane being methyl, any remaining silicon-bonded substituents being selected from mono valent hydrocarbon groups having from 2 to 20 carbon atoms, $-RNH_2$ groups, $-RCOOH$ groups and $-R[NH(CH_2)_n]_pNH(CH_2)_nNH_2$ groups.

4,624,795

AQUEOUS ACID GELS AND USE THEREOF

Jeffrey C. Dawson, Katy; Robert R. McDaniel, and Lawrence P. Sedillo, both of Houston, all of Tex., assignors to BJ-Titan Services Company, Houston, Tex.

Filed Mar. 28, 1985, Ser. No. 717,208
Int. Cl.[4] E21B *43/27*
U.S. Cl. 252—8.553 **8 Claims**

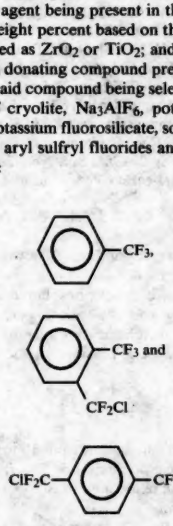
1. An aqueous gel useful in fracture acidizing of oil and gas bearing formations, comprising:

an aqueous acid;

a copolymer containing about 45 to 94 weight percent acrylamidomethylpropane sulfonic acid, about 5 to 45 weight percent of acrylamide, and about 1 to 6 weight percent vinyl phosphonic acid;

a cross-linking agent for the copolymer comprising a polyfunctional acid compound of zirconium or titanium, the cross-linking agent being present in the range from about 0.25 to 5.0 weight percent based on the weight of copolymer, calculated as ZrO_2 or TiO_2; and

a fluoride anion donating compound present in a gel degrading amount, said compound being selected from the group consisting of cryolite, Na_3AlF_6, potassium, hexafluorophosphate, potassium fluorosilicate, sodium tetrafluoroborate, alkyl or aryl sulfryl fluorides and organic halides of the formulae:



4,624,796

PIEZOELECTRIC FILLER AND FLEXIBLE PIEZOELECTRIC COMPOSITES

Jayne R. Giniewicz; Ahmad Safari; Robert E. Newnham, and Leslie E. Cross, all of State College, Pa., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 742,333, Jun. 7, 1985. This application Dec. 4, 1985, Ser. No. 804,574
Int. Cl.[4] C04B *35/00, 35/02, 35/46*
U.S. Cl. 252—62.9 **12 Claims**

1. A piezoelectric ceramic comprising a $PbTiO_3$-$BiFeO_3$ solid solution having 0.5 to 10 mol. % of the iron content replaced with manganese.

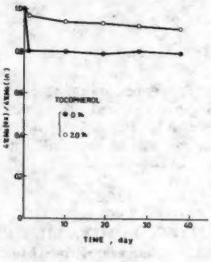
4. A piezoelectric-polymer composite material of 0–3 connectivity which comprises: a matrix of insulating polymer and a piezoelectric ceramic powder disbursed within said polymer matrix, said ceramic powder comprising a $PbTiO_3$-$BiFeO_3$ solid solution wherein 0.5 to 10 mol. % of the iron content is replaced with manganese.

4,624,797

MAGNETIC FLUID AND PROCESS FOR PREPARING THE SAME

Katsuhiko Wakayama, and Hiraku Harada, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,357
Claims priority, application Japan, Sep. 17, 1984, 59-194321; Sep. 18, 1984, 59-194985
Int. Cl.[4] C09D *5/23;* C10M *3/44;* H01F *1/25*
U.S. Cl. 252—62.52 **19 Claims**



1. A magnetic fluid comprising metal fine particles of cobalt, a surface-active agent selected from the group consisting of an oil-soluble anionic sulfosuccinate surface-active agent and a nonionic surface-active agent which is a polyglycerine fatty acid ester or polyethylene glycol alkyl ether, and a low-volatile solvent medium.

4,624,798

ELECTRICALLY CONDUCTIVE MAGNETIC MICROBALLOONS AND COMPOSITIONS INCORPORATING SAME

Wayne L. Gindrup, Hickory, and Rebecca R. Vinson, Conover, both of N.C., assignors to Carolina Solvents, Inc., Hickory, N.C.

Continuation-in-part of Ser. No. 612,622, May 21, 1984. This application Feb. 19, 1985, Ser. No. 702,684
Int. Cl.[4] H01F *1/00, 1/26;* C04B *35/04;* H01B *1/06*
U.S. Cl. 252—62.54 **11 Claims**

1. Electrically conductive microparticles characterized by high conductivity and low density, said microparticles comprising hollow microballoons of a ceramic silicate composition containing magnetic impurities imparting permanent magnet properties which render the microballoons magnetically attractive to one another to form a network of contacting particles, and a plating of an electrically conductive metal uni-

formly covering the surface of said microballoons and imparting electrically conductive properties thereto.

4,624,799

MIXTURE FOR USE IN THE LSC (LIQUID SCINTILLATION COUNTING) ANALYSIS TECHNIQUE

Theodorus C. J. M. Hegge, Kloosterburen, and Jan ter Wiel, Loppersum, both of Netherlands, assignors to Packard Instrument B.V., Groningen, Netherlands

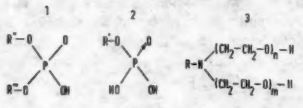
Filed Sep. 14, 1984, Ser. No. 650,925

Claims priority, application Netherlands, Sep. 16, 1983, 8303213

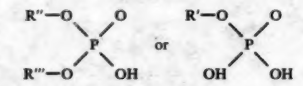
Int. Cl.[4] C09K *11/06*

U.S. Cl. 252—301.17 **7 Claims**

1 2 3



1. A liquid, homogenous mixture for use in liquid scintillation counting analysis techniques, said mixtures comprising a scintillation liquid, a scintillator and a surfactant wherein the improvement comprises a surfactant comprising one or more neutralized mono- or di- phosphate esters, said esters being the reaction product of one or more phosphoric acid esters having the formula



wherein R', R'' and R''' represent organic groups selected from the group consisting of alkyl, aryl, alkoxylated alkyl or alkoxylated alkyl phenyl and R'' and R''' may be the same or different; and an alkaline material having a pK_a of at least 5.

4,624,800

METHOD FOR PRODUCING AQUEOUS, LOW-ALKALI METAL, LOW-ALUMINA SILICA SOLS

Yutaka Sasaki; Toshio Nakamura; Hiroshi Murata, and Yoshimi Nakamura, all of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,719

Claims priority, application Japan, Dec. 10, 1983, 58-232245

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—313.2 **16 Claims**

1. A method for producing an aqueous silica sol, comprising admixing a fine silica powder having an ultimate particle size of from 5 to 200 millimicrons, a content of sodium of not more than 500 ppm and a content of alumina of not more than 1000 ppm with an aqueous medium at a pH not higher than 5 while applying ultrasonic vibrations having a frequency within the range of from 10 to 100 kilohertz to the aqueous medium to thereby disperse said silica powder in said aqueous medium and thus convert the mixture into an aqueous sol.

4,624,801

ANISOTROPICALLY ELECTROCONDUCTIVE ADHESIVE

Toshiyuki Kawaguchi, Saitama; Takashi Nogami, Tokyo, and Koichi Nei, Chiba, all of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1985, Ser. No. 764,858

Claims priority, application Japan, Aug. 16, 1984, 59-170791

Int. Cl.[4] H01B *1/00*

U.S. Cl. 252—500 **5 Claims**

1. An electroconductive adhesive composition which comprises a matrix of an electrically insulating, thermosetting polyester-based urethane resin admixed with a masked isocyanate compound as the curing agent and electroconductive particles dispersed in the matrix.

4,624,802

SALICYLIC ACID ESTERS OF CARBOCYCLIC ALCOHOLS AS PERFUMES OR SCENTING AGENTS, PERFUMERY COMPOSITIONS AND SALICYLIC ACID ESTERS

Ulf-Armin Schaper; Benno Streschnak, both of Krefeld; Siegfried Bloesl, Duesseldorf, and Walter Sommer, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

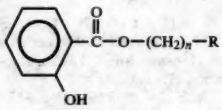
Filed Jan. 2, 1985, Ser. No. 688,129

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1984, 3400342

Int. Cl.[4] C11B *9/00*; C07C *69/88*

U.S. Cl. 252—522 R **17 Claims**

1. In the process of scenting, comprising the steps of treating the material to be scented with an application of a scenting-effective amount of a scenting agent, the improvement consisting of using a salicylic acid ester having the formula:



wherein R is a cyclic group having from 5 to 9 carbon atoms selected from the group consisting of cycloalkyl, C_1–C_4-alkylcycloalkyl, cycloalkenyl and C_1–C_4-alkylcycloalkenyl, and n is an integer from 0 to 3, as said scenting agent.

4,624,803

FATTY ALCOHOL OXYALKYLATES, POSSESSING BLOCKED TERMINAL GROUPS, FOR INDUSTRIAL CLEANING PROCESSES, IN PARTICULAR BOTTLE-WASHING AND METAL-CLEANING

Wolf-Dieter Balzer, Ludwigshafen; Klaus Lorenz, Worms; Helmut Wolf, Hassloch; Wolfgang Trieselt; Dieter Stoeckigt, both of Ludwigshafen, and Albert Hettche, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,110

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418523

Int. Cl.[4] C11D *3/33, 3/075, 7/16*

U.S. Cl. 252—527 **5 Claims**

1. A liquid cleaner for industrial bottle washing, which comprises

from 5 to 30% by weight of phosphonic acid,

from 15 to 30% by weight of phosphoric acid,

from 0 to 10% by weight of isopropanol,

from 10 to 30% by weight of a non-ionic surfactant having the formula 1

$$R—O—(X_1)_n—(X_2)_m—Z$$

where R is alkyl group having from 10 to 18 carbon atoms, X_1 is an ethylene oxide unit, n is 5 to 7, X_2 is a propylene oxide or butylene oxide unit, m is 2 to 4, and Z is methyl, ethyl or allyl, and

water to make up 100% by weight.

4,624,804

PROCESS OF PREPARING RELAXIN FROM MILK

Wolfgang Voelter, Tubingen-Hagelloch, and Theodor Lippert, Tubingen, both of Fed. Rep. of Germany, assignors to Serono Pharmazeutische Praparate GmbH, Freiburg, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,760

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236264

Int. Cl.[4] C07K *7/10;* A61K *37/24*

U.S. Cl. 530—366 1 Claim

1. A process for recoverying relaxin from decaseined mammalian milk which comprises adding to decaseined mammalian milk while maintaining it at a temperature of 1°–15° C., acetone in a ratio of 0.5–5.0/1.0, by volume, to precipitate protein from said decaseined milk without precipitating relaxin therefrom; separating precipitated protein from said decaseined milk while maintaining said temperature; adding to the resultant protein-free, decaseined milk acetone cooled to a temperature of about −10° to about −70° C. in a ratio of 1.0–10/1.0, by volume, to precipitate relaxin therefrom; maintaining said temperature for approximately 24 hours; separating precipitated relaxin from said protein-free, decaseined milk; suspending said precipitated relaxin in a 0.5–5 fold volume of an ammonium acetate buffer solution having a pH of 4.8–5.6; adding to said suspension 0.1–0.5% sodium azide; subjecting the resultant mixture to at least one of (a) ultra-membrane filtration and (b) ion exchange chromotography having an exclusion of 10,000–100,000 Daltons, in combination with gel filtration; and concentrating and recoverying a purified relaxin.

4,624,805

PROCESS FOR RECOVERY OF PROTEIN FROM AGRICULTURAL COMMODITIES PRIOR TO ALCOHOL PRODUCTION

James T. Lawhon, College Station, Tex., assignor to The Texas A&M University System, College Station, Tex.

Filed Sep. 27, 1984, Ser. No. 655,037

Int. Cl.[4] A23J *1/12*

U.S. Cl. 530—376 18 Claims

1. A process for recovering protein from agricultural commodities prior to alcohol production, said process comprising the steps of:

obtaining a suitable agricultural commodity in a form suitable for extraction of protein;

extracting protein from said agricultural commodity with an alkali solution which forms a dispersion with said agricultural commodity;

separating the dispersion into a solids fraction and a liquids fractions, said liquids fraction containing extracted protein;

removing the protein from said liquids fractions by ultrafiltration using a membrane having a molecular weight cutoff between about 10,000 and about 30,000 daltons; and

utilizing said solids fraction for alcohol production.

4,624,806

COMPACT PORTABLE HUMIDIFIER

Kathleen Koszyk, 10 Meadowood La., Northfield, Ill. 60093

Continuation-in-part of Ser. No. 709,773, Mar. 8, 1985, Pat. No. 4,540,529. This application Aug. 19, 1985, Ser. No. 766,519

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—91 8 Claims

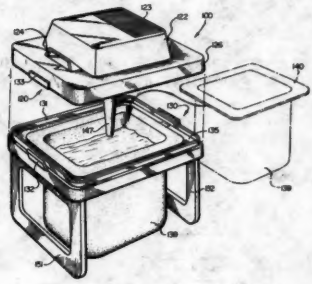
1. An improved portable humidifier for use on a horizontal surface, the humidifier comprising:

a compact humidifier head including means for generating a stream of air and for enriching the water content of said stream of air and a horizontally-extending annular support surface formed about and spaced from said means;

a flexible bag carried by said humidifier head and adapted to hold water in communication with said means for enriching the water content of said stream of air;

the flexible bag having an upper opening and a relatively stiff, generally flat collar means extending outwardly from said upper opening for engagement with and support by said support surface of said humidifier head; and

support legs connected to said humidifier head, said legs being foldable to a first position to lie immediately below



the head and extendible to a second position to support the head a fixed distance above said surface,

whereby the flexible bag holds sufficient water when said legs are in their second position for distribution into a room over a desired time to achieve effective room humidification.

4,624,807

PROCESS FOR PRODUCING MICROSPHERICAL, OIL-CONTAINING CARBONACEOUS PARTICLES

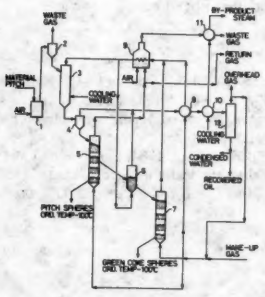
Terukatsu Miyauchi, Yokohama; Yoneichi Ikeda, Kamakura; Takao Nakagawa; Toshio Tsutsui, both of Ichikawa, and Tatsuji Kikuchi, Tokyo, all of Japan, assignors to Fuji Standard Research Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,371

Claims priority, application Japan, Jul. 28, 1982, 57-130477

Int. Cl.[4] B29B *9/16*

U.S. Cl. 264—12 8 Claims



1. A process for the production of coke particles which comprises grinding a petroleum or coal pitch having a softening point in the range of 60° to 220° C. and a fixed carbon content of 40 to 70 wt % into finely divided pitch at a temperature at which said pitch remains in the solid state, introducing the finely divided pitch into a gas substantially inert to the pitch and at a temperature from 100° to 800° C. but at least about 20° C. above the softening point of the pitch, under a pressure from standard pressure to 10 Kg/cm^2 to form a pitch-gas mixed stream, rapidly cooling the mixture to a range of 30° to 400° C. but below the temperature of the mixed stream, and then recovering microspherical pitch particles and oil and converting the pitch particles to green coke particles by

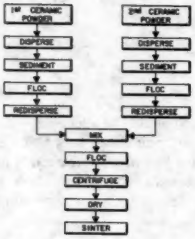
thermal cracking and polycondensation of the pitch spheres obtained in the first step in a fluidized bed at a temperature from 350° to 520° C., a pressure from the standard pressure to 10 Kg/cm^2 for an average retention time of one minute to three hours, and then separately recovering microspherical green coke particles and a light cracked oil.

4,624,808

FORMING A CERAMIC BY FLOCCULATION AND CENTRIFUGAL CASTING

Frederick F. Lange, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 15, 1984, Ser. No. 610,378
Int. Cl.^{4} B28B *1/20*
U.S. Cl. 264—23 **12 Claims**



1. A method of fabricating a structural ceramic comprising the steps of:

dispersing ceramic particles in a liquid;

sedimenting the disposed particles to remove large particles and agglomerates;

flocculating the dispersed ceramic particles;

removing the clear supernate from the flocced ceramic particles;

centrifuging said flocced ceramic particles to produce a consolidated mass capable of retaining its shape; and

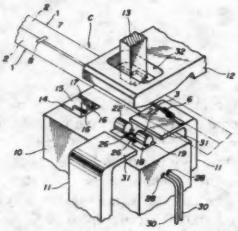
sintering the centrifuged ceramic particles.

4,624,809

METHOD AND APPARATUS FOR FORMING UPPER STEPS OF A CONCEALED TYPE SLIDE FASTENER

Yoshitaka Iimura, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,373
Claims priority, application Japan, Oct. 11, 1983, 58-211275
Int. Cl.^{4} B29C *65/08*; B29D *5/00*
U.S. Cl. 264—23 **5 Claims**



1. A method of forming upper stops of a concealed type slide fastener comprising a pair of fastener stringers each consisting of a fastener tape having a turn-up along one side thereof and a row of fastener elements of thermoplastic resin secured to the turn-up, each fastener element having an interengaging head and leg portion secured to the turn-up the method comprising:

providing a punch guide on a base, said punch guide having a pair of spaced projections and each of said projections having opposite sides provided with stepped portions, respectively;

placing the projections so that the projections pass between the stringers;

urging the fastener elements on each of the fastener stringers in the direction away from said leg portions and towards said interengaging heads of the elements while the element-mounting-side margin of the tape is engaged and arrested by the associated stepped portions of the projections thereby exposing said interengaging heads of the elements extending between the projections from said margin; and

fusing the interengaging heads of the elements extending between said projections of form the upper stops.

3. An apparatus for forming upper stops on a concealed type slide fastener chain comprising a pair of continuous fastener stringers each consisting of a fastener tape having a turn-up along one side thereof and fastener elements of thermoplastic resin secured to the turn-up, each fastener element having an interengaging head and leg portion secured to the turn-up, the apparatus comprising:

means for transporting said fastener chain in a predetermined path;

a base provided along said path of the fastener chain for vertical movement towards and away from the fastener chain and having a pair of guide channels vertically formed in the base on the opposite sides of the centerline of said path of the fastener chain;

a pair of punches mounted for vertical movement in said guide channels, respectively;

an ultrasonic horn provided on the side opposite to said base with respect to said path of the fastener chain and for vertical movement;

projections formed on said base on the upstream and downstream sides of said guide channels such that the projections are inserted between the pair of stringers when the base is raised; and

hammers provided on the opposite sides of the path of the fastener chain and each having a punch portion overlying the base and reciprocating towards and away from said projections such that when it moves towards said projections it urges the elements of the fastener stringer in the direction away from the leg poritons and towards the interengaging heads of the elements,

said projections having portions which engage and arrest the element-mounting-side margins of the fastener tapes when said elements are urged towards the projections and said ultrasonic horn having portions which press the elements extending between said projections against said punches in their raised positions.

4,624,810

PRODUCTION OF A SOLID STICK IN A CONTAINER

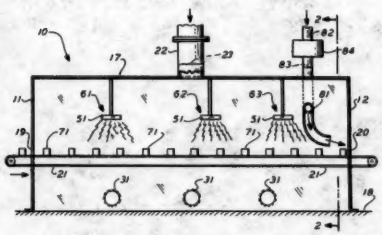
Frederick P. Sisbarro, Wayne, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Division of Ser. No. 424,317, Sep. 27, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,292
Int. Cl.^{4} B29C *59/16*
U.S. Cl. 264—25 **4 Claims**

1. A process for treating a solid antiperspirant or deodorant stick composition in a container, comprising:

moving a container including the solid stick composition through a protective tunnel between an inlet and outlet for said tunnel; maintaining said tunnel at a temperature below the melting temperature of the solid stick composition by introducing air into and withdrawing air from the tunnel; effecting controlled localized heating of the solid stick composition at at least two spaced heating stations in the tunnel, said heating being effected to remelt a portion

of the solid stick composition only at a heating station; and cooling the stick composition within the tunnel by the circulating air to solidify a liquid portion of the solid stick



composition prior to each of said at least two heating stations and prior to the outlet for said tunnel, whereby there is an overall cooling effect in the tunnel and controlled localized heating at the heating stations.

4,624,811

PROCESS FOR PREPARING A VITREOUS CARBON

Phillip A. Waitkus, and Louis L. Korb, both of Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 668,396, Nov. 5, 1984, abandoned, which is a continuation of Ser. No. 502,181, Jun. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 356,893, Mar. 10, 1982, abandoned, which is a continuation of Ser. No. 182,755, Aug. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 50,531, Jun. 21, 1979, abandoned. This application Oct. 1, 1985, Ser. No. 782,314

Int. Cl.[4] C01B *31/02, 31/04*

U.S. Cl. 264—29.5 **31 Claims**

1. A process for preparing a vitreous carbon of improved freedom from pits and holes and much less subject to cracking and failure during formation and use, comprising the steps of:

(1) molding a moldable composition of improved mold flow properties prepared by the addition of a phenolic-aldehyde Novolac resin in which at least 50 molar percent of said aldehyde is furfuraldehyde to an aqueous solution or suspension of a phenolic-aldehyde resol resin prior to the removal of 90 percent of the removable water from said resol resin solution or suspension, the proportions of said resins comprising 20–80 parts by weight of said Novolac resin and 20–80 parts by weight of said resol resin with the combined weight of said two resins comprising 100 parts by weight, thereafter effecting coreaction of said resins together with an amine selected from the group consisting of hexamethylenetetramine and amines in which there is at least one hydrogen connected to a nitrogen atom, the amount of said amine being equivalent to 1–15 percent by weight of hexamethylenetetramine based on the total weight of phenolic component, and removal of water from the resulting reaction mass while maintaining the resin in a moldable condition, the Novolac resin having been prepared with the removal of at least 25 percent by weight of the water removable during the Novolac preparation, and prior to said molding intimately mixing said coreacted resins with 5–76 percent by weight of a finely divided carbonaceous filler based on total molding composition, said molding being effected at a temperature of 100°–180° C. and a pressure between 500 pounds per square inch and 8 tons per square inch; and

(2) heating the resultant molded product gradually up to a final temperature of at least 1800° and holding at said final temperature for at least 24 hours.

4,624,812

INJECTION MOLDABLE CERAMIC COMPOSITION CONTAINING A POLYACETAL BINDER AND PROCESS OF MOLDING

Gerry Farrow, New Providence, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 459,744, Jan. 21, 1983, abandoned. This application Jul. 8, 1985, Ser. No. 752,489

Int. Cl.[4] C04B *35/64;* **C08K** *3/00*

U.S. Cl. 264—63 **13 Claims**

1. A solvent-free ceramic composition suitable for injection molding and sintering consisting essentially of:

(a) a ceramic powder

(b) a binding agent in an amount effective to permit injection molding of the composition and ranging from about 20 to about 35% by weight of the composition, said binding agent being comprised of at least 90% by weight of a polyacetal having the recurring unit.

4,624,813

ELASTOMER-COATED BIAS REINFORCEMENT FABRIC AND METHOD AND APPARATUS FOR PRODUCING SAME

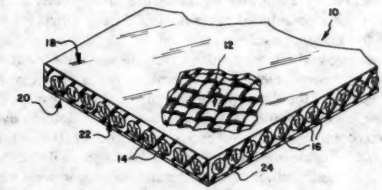
Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 350,969, Feb. 22, 1982, Pat. No. 4,501,771. This application Jul. 5, 1984, Ser. No. 628,072

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.[4] B29G *5/00*

U.S. Cl. 264—137 **12 Claims**



1. In a method of making a flexible reinforcing strip or the like having a layer of fabric means and polymeric layer means secured on both sides of said layer of fabric means, said method comprising the steps of providing said layer of fabric means, transversely stretching said layer of fabric means to a stretch condition thereof, applying said polymeric layer means in liquid form to said sides of said layer of fabric means while said layer of fabric means is in said stretched condition thereof, and then drying said polymeric layer means that has been applied to said layer of fabric means, the improvement comprising the step of further transversely stretching said layer of fabric means after said polymeric layer means has been applied thereto and before said polymeric layer means has been dried thereon.

4,624,814

PROCESS FOR THE MANUFACTURE OF PRODUCTS FROM REINFORCED POLYESTER RESINS

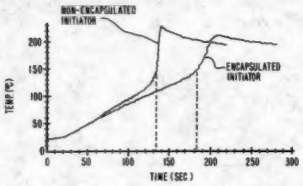
John R. McDougal, 7043 Strout Rd., Morrow, Ohio 45152

Division of Ser. No. 587,319, Feb. 21, 1984, Pat. No. 4,524,043, which is a continuation-in-part of Ser. No. 510,596, Jul. 5, 1983, abandoned, and a continuation-in-part of Ser. No. 441,385, Nov. 12, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 702,212

The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.[4] B29C *43/02*

U.S. Cl. 264—137 12 Claims



1. A process for the manufacture of a molded, reinforced polyester resin polymeric product comprising the steps of:

(a) forming by intensively mixing a ready-to-mold BMC resin and reinforcement composite of an unsaturated polyester resin reactant, a cross-linking monomer, reinforcing material, and microcapsules of from 5 to 200 microns in diameter containing a liquid phase including an initiator for cross-linking of the polyester resin reactant and the monomer, said microcapsules isolating said initiator from said resin until a predetermined elevated temperature of at least about 108° C. is reached in the process;

(b) introducing a predetermined amount of said composite into a cavity of a mold;

(c) applying heat and pressure to said composite to fill said mold cavity uniformly with mixture prior to any significant initiator-induced cross-linking during a first portion of the molding cycle;

(d) causing said microcapsules to release said initiator at said predetermined elevated temperature by using the vapor pressure of the liquid phase within the microcapsules, and thereby terminating said first portion of the molding cycle and commencing a second exothermic portion of the molding cycle, said microcapsules having a wall thickness and strength sufficient to withstand the vapor pressure of said liquid phase up to the internal pressure developed in the microcapsules at said predetermined elevated temperature;

(e) effecting substantially all initiator-induced cross-linking during said second exothermic portion of the molding cycle whereby said first portion of said molding cycle is substantially prolonged by maintaining said initiator in said microcapsules and the prolongation of the first portion of said molding cycle permits the use of increased molding temperatures and a net reduction in the overall molding cycle as compared with the use of such initiator in the composite in a conventional non-encapsulated form; and

(f) removing the cured composite from said mold cavity to provide said polymeric product.

4,624,815

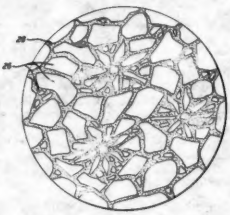
PROCESS OF PRODUCING MOSAIC ARTICLES

Michael N. Moufarrege, 1573 Elmwood Ave., Rochester, N.Y. 14620

Filed Mar. 12, 1985, Ser. No. 711,007

Int. Cl.[4] B28B *11/08;* B29C *39/12;* B32B *3/14, 31/06*

U.S. Cl. 264—162 10 Claims



1. A process for producing slabs having a pattern on one surface thereof formed by exposed surfaces of mosaic stones arranged in a predetermined pattern, said process comprising:

(a) placing a spacer member upon a horizontal support surface;

(b) positioning a flat wooden sheet of predetermined outline with the lower surface thereof resting upon said spacer member, the latter being contained entirely within said predetermined outline, the upper surface of said sheet lying in a horizontal plane a predetermined distance above said support surface;

(c) arranging a plurality of border stones in closely spaced succession about the entire perimeter of said wooden sheet, said border stones resting upon said support surface and extending to a substantially uniform height substantially flush with the upper surface of said wooden sheet;

(d) arranging a plurality of mosaic stones in a desired pattern closely spaced relation over substantially all of said wooden sheet upper surface and extending over the upper surfaces of said border stones, said mosaic stones being cut to a substantially uniform thickness and ground substantially flat on both sides said stones being placed with the surfaces thereof which are to form said exposed surfaces of the finished slab facing upwardly;

(e) pouring a first quantity of hardenable resin material in liquid state over said mosaic stones to fill all spaces therebetween, and to extend at least partly between said mosaic stones and said border stones and between the lower surfaces of said mosaic stones and said wooden sheet upper surface;

(f) allowing said resin to dry, thereby forming a unitary sheet of said mosaic and border stones and ssaid wooden sheet with said exposed surfaces of said mosaic stones facing upwardly between said spaces filled by said resin material

(g) inverting said unitary sheet to place said lower surface of said wooden sheet in an upwardly facing direction, and placing it upon a horizontal support;

(h) filling the area over said upwardly facing lower surface of said wooden sheet bounded by said border stones with a second quantity of hardenable resin material substantialy to a plane defined by the edges of said border stones to form a continuous resin layer;

(i) allowing said resin layer to dry, thereby providing a unitary slab having one major surface of polished mosaic stones, and the opposite major surface of a continuous resin layer surrounded by said border stones with resin filling the spaces therebetween; and

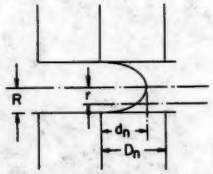
(j) polishing said exposed surface of said mosaic stones to provide a finish of desired smoothness and to remove all excess resin from said exposed surface.

4,624,816

PROCESS FOR THE MANUFACTURE OF POLYAMIDE FIBERS

Kazuo Kurita, Otsu, and Hideaki Ishihara, Uji, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha (Toyobo Co., Ltd.), Japan

Division of Ser. No. 415,773, Sep. 8, 1982, Pat. No. 4,504,545.
This application May 31, 1984, Ser. No. 615,619
Claims priority, application Japan, Sep. 8, 1981, 56-142162
Int. Cl.[4] D01D 5/12
U.S. Cl. 264—210.7 13 Claims



1. A process for the manufacture of polyamide fibers which comprises the steps of: melt spinning a polyamide having a relative viscosity of not less than 3.50 under the conditions satisfying the following relationships:

$Q/D^3 \leqq 982$ g/sec.cm^3

$D^2.Vw/Q \leqq 12.8$ cm^3/g

$T_{20} \geqq 100°$ C.

Δn of unstretched filament $\leqq 0.017$

(wherein Q is the discharge amount per each nozzle hole (g/sec); D is the diameter of each nozzle hole (cmϕ), Vw is the take up speed of spun filaments (cm/sec) T_{20} is the atmospheric temperature at a distance of 5 mm from the spun filaments and at a distance of 20 mm from the nozzle face towards the discharge of the filaments (°C.) and Δn of the unstretched filaments is the value determined after the filaments are allowed to stand at a temperature of 30° C. under a relative humidity of 80% for a period of 24 hours);

subjecting the resultant filaments to cooling;

further subjecting the resulting filaments to stretching and heat treatment; and

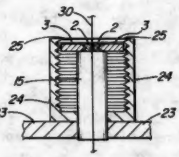
providing said fibers with a break strength of not less than 11.0 g/d, said break strength (g/d)×(the break elongation (%))$^{\frac{1}{2}}$ being not less than 46.0, and a monofilament denier of not more than 60d.

4,624,817

DILATABLE, INDIVIDUALLY CAST COATING DIE

James A. Gusack, and Thomas E. Smith, both of Williamsburg, Va., assignors to Badische Corporation, Williamsburg, Va.

Filed May 18, 1984, Ser. No. 611,565
Int. Cl.[4] B29C 67/00; B23P 11/00, 19/04; B05C 3/02
U.S. Cl. 264—225 11 Claims



1. A process for both making and stringing up a dilatable coating die, the process comprising the steps of:

(a) mounting a substantially nondeformable plate in a horizontal position, the nondeformable plate having at least one internal surface which defines a perforation which is through the nondeformable plate, the internal surface being shaped in order to provide a fastening surface for a material which is to be cast within the perforation; and

(b) threading a yarn segment through the perforation, the yarn having a diameter d which is the same size as a desired diameter for a dilatable passageway which is to be produced in an inner flexible portion of the coating die; and

(c) positioning the yarn in a slit, the slit being within a second plate which has been slit partially therethrough, the second plate being both flexible and slittable, the second plate having a protrusion of a desired size which is integral therewith, the protrusion being out of the plane of the second plate, the slit passing through the protrusion, the protrusion being shorter than the thickness of the nondeformable plate, the protrusion fitting wholly within the perforation, the second plate being mounted directly underneath the nondeformable plate with the protrusion and the yarn being positioned within the perforation of the nondeformable plate so that a generally cup-shaped reservoir is formed, the yarn being positioned within the reservoir so that the yarn is, in every direction, spaced substantially at least a distance d from the internal surface which defines the perforation, the yarn positioned within the slit so that the yarn emerges from the protrusion at a desired distance from a top surface of the nondeformable plate upon positioning the nondeformable plate, the yarn, and the second plate to form the reservoir; and

(d) filling the reservoir with a castable material which is compatible with the yarn, the slit plate, and the nondeformable plate, the castable material filling the reservoir to a point above the tip of the protrusion, the amount of castable material added to the reservoir being carefully controlled in order to control the length of the passageway which is to be formed through the castable material, the material being of a type such that upon hardening the material will have a Shore A Hardness Value between 20 and 100; and

(e) allowing the castable material to harden sufficiently; and

(f) removing the second plate while leaving the yarn segment threaded through the cast portion of the die.

4,624,818

ROTATIONAL MOLDING PROCESS USING ABRASIVE-RESISTANT NYLON COMPOSITION

Carlin J. Black, New York, N.Y., and Frederick N. Bauer, Jr., Wayne, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 25, 1982, Ser. No. 361,684
Int. Cl.[4] B28B 1/20
U.S. Cl. 264—255 14 Claims

1. A method of rotationally molding an article in a rotational mold having a mold cavity and an inner mold surface comprising the steps of:

feeding the polymer to the cavity;

heating the mold to at least the melting temperature of the polymer;

rotating the mold to form an outer layer of polymer on the inner mold surface, the outer layer of polymer having an inner surface;

heating an abrasive resistant filler to at least the melting temperature of the polymer;

feeding the abrasive resistant filler into the mold cavity;

feeding additional polymer into the mold;

rotating the mold to form a uniform layer of polymer and filler on the inner surface of the outer layer of polymer;

cooling the mold; and

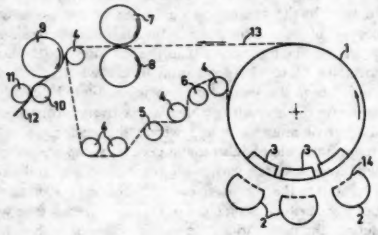
removing the article.

4,624,819

METHOD FOR PRODUCING LAYERS OF DRY FIBRES ON A FORMING SURFACE

Stefan M. Hartog, Stockholm, and Bernt H. F. Hollmark, Huddinge, both of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

Filed Dec. 7, 1984, Ser. No. 679,539
Claims priority, application Sweden, Dec. 23, 1983, 8307147
Int. Cl.[4] D04H *1/70*
U.S. Cl. 264—510 18 Claims



1. A method for manufacturing one or more layers of a substantially dry fibrous and/or particulate material on a forming surface which is pervious to air comprising the steps of (i) distributing the fibrous and/or particulate material into a gas, (ii) leading said material in an adjustable flow and at an adjustable concentration to a housing section of a forming unit having a wall which is in part substantially cylindrical in form and in part comprises a screening device (iii) introducing a stream of the fibrous and/or particulate material into the housing section in an axial direction and causing air or another gas to flow at a high velocity into the housing section through nozzles arranged along the walls of the housing section in a direction substantially transverse to the fibre/particulate stream in order to achieve high intensity turbulence therein, and (iv) causing a portion of said fibrous and/or particulate material in the housing section to be conducted through the screening device in the wall of the housing section and onto the forming surface while causing material not conducted through the screening device to be conducted through an outlet arranged axially of the housing section.

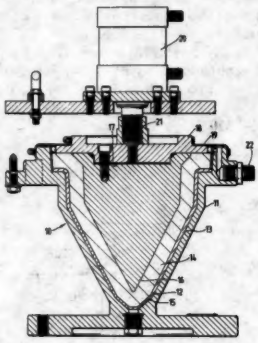
4,624,820

MOLDING OF COMPOSITE MATERIALS

David J. Barraclough, Derby, England, assignor to Rolls-Royce plc, London, England

Filed May 2, 1985, Ser. No. 729,871
Claims priority, application United Kingdom, Jun. 22, 1984, 8415959
Int. Cl.[4] B29C *47/06*
U.S. Cl. 264—512 6 Claims

1. A method of molding a composite material comprising laying up a plurality of layers of resin impregnated fibres in a suitable shaped die, overlaying said resin impregnated fibres with a resilient deformable member generally corresponding in shape with that of said die, preheating the assembly at a temperature below that at which the resin cures, exerting pressure upon said resilient deformable member so that it deforms to urge said laid-up resin impregnated fibres into the configuration of said die, heating the assembly so that said resilient deformable member thermally expands to increase the pressure exerted thereby upon said resin impregnated laid-up fibres whilst simultaneously decreasing the pressure exerted upon said resilient deformable member at such a rate that the pressure exerted by said resilient deformable member upon said resin impregnated laid-up fibres remains substantially constant and continuing the heating of said resin impregnated fibres and the maintenance of the exertion of said substantially constant



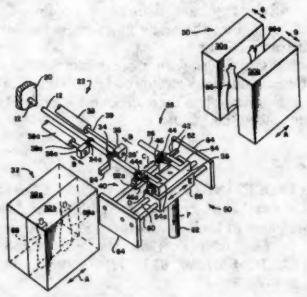
pressure thereon until said laid-up resin impregnated fibres have been consolidated.

4,624,821

PROCESS FOR FORMING ORIENTED CONTAINERS

Harry A. Younkin, Newark, Del.; Gottfried Mehnert, Berlin, and Uwe V. Roos, Bodenteich-Uelzen, both of Fed. Rep. of Germany, assignors to Metal Box Enterprises Inc., Westport, Conn.

Division of Ser. No. 169,141, Jul. 15, 1980, Pat. No. 4,560,340.
This application Jul. 31, 1985, Ser. No. 760,989
Claims priority, application Fed. Rep. of Germany, May 16, 1980, 801027061
Int. Cl.[4] B29C *49/14*
U.S. Cl. 264—532 21 Claims



1. A process for the formation of finished hollow containers of molecularly oriented plastic material from tubular parisons of orientable material heated to a suitable orientation temperature for the material, comprising:

a. providing along a horizontal axis a supply of tubular parisons of orientable material;

b. transferring parisons with a transfer means having adjacently disposed gripping means rotatable about an axis oriented perpendicularly to the supply axis by operating said transfer means to move said parison gripping means in a plane oriented substantially perpendicularly to said horizontal supply axis to align each gripping means along said horizontal axis, to grip an end portion of a parison with each gripping means and to rotate gripped parisons from the horizontal position;

c. providing a molder having molding means to form a container;

d. gripping the free end portion of a rotated parison and stretching the parison longitudinally to molecularly orient the parison material;

e. placing the stretched parison in the molder wherein substantially the entire container is formed from the molecularly oriented material of the stretched parison; and

f. returning the transfer means into position to receive and transfer additional parisons.

4,624,822

METHODS FOR MANUFACTURE OF VALVE FLAPS FOR CARDIAC VALVE PROSTHESES

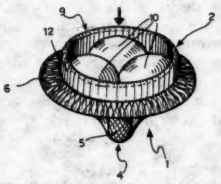
Pietro Arru; Gioacchino Bona, both of Turin; Maria Curcio, Saluggia, and Franco Vallana, Turin, all of Italy, assignors to Sorin Biomedica S.p.A., Saluggia, Italy

Filed Jul. 25, 1984, Ser. No. 634,085

Claims priority, application Italy, Jul. 25, 1983, 67802 A/83

Int. Cl.[4] B29C *51/10*; A61F *2/24*

U.S. Cl. 264—544 8 Claims



1. A process for the manufacture of valve flaps for a cardiac prosthesis from a sheet of biological tissue free of such flaps, comprising:

providing forming means having spaced apertures therein,

applying the sheet of biological tissue free of valve flaps to said forming means with portions of the biological tissue extending over the spaced apertures in a fluid-tight manner,

generating a fluid pressure differential across opposite surfaces of said portions of the biological tissue extending over said apertures to deform said portions into conformations substantially the same as the conformations of the valve flaps when mounted in a prothesis,

effecting formal fixation of the biological tissue while maintaining a pressure differential across said opposite surfaces of said formed valve flap portions to substantially stablize said valve flap portions, and

removing the biological tissue with its substantially stable valve flap portions from said forming means.

4,624,823

BLOWN TUBING METHOD AND APPARATUS

Joël Audureau, Noeux les Mines; Michel R. Caron, Lille, and Vincent Hervais, Bully-les-Mines, all of France, assignors to Societe Chimique des Charbonnages S.A., Paris, France

Filed Jun. 29, 1984, Ser. No. 625,896

Claims priority, application France, Jun. 29, 1983, 83 10721; May 24, 1984, 84 08123

Int. Cl.[4] B29C *49/04*

U.S. Cl. 264—569 22 Claims

1. Apparatus for cooling a plastic film tubing issuing from an annular extrusion die comprising:

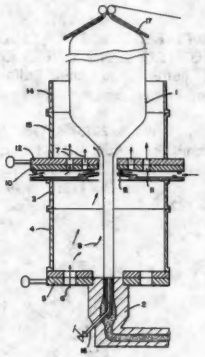
non-closed lower chamber means including a wall positioned radially outward of the plastic film tubing and above the extrusion die for directing air flow past the tubing so that the tubing is moderately cooled and does not undergo appreciable dimensional modifications, the lower chamber means including an opening means for allowing influx of air flow into the lower chamber;

an intensive blowing ring means positioned above the lower chamber means for directing air flow toward the tubing so that the tubing is intensely cooled; and

upper chamber means positioned above the intensive blowing ring means for directing air flow along the tubing in the drawing direction of the tubing so that the tubing is further cooled.

17. Process of extruding and cooling a plastic film tubing comprising:

extruding molten plastic material from an extrusion die to form a tubing;



moderately cooling the tubing by drawing it through a lower chamber positioned around the tubing above the extrusion die and directing air flow through the lower chamber so that the tubing does not undergo appreciable dimensional modifications;

intensely cooling the plastic material by directing air flow toward the tubing from a blowing ring positioned around the tubing above the lower chamber; and

further cooling the tubing by drawing it through an upper chamber positioned around the tubing above the blowing ring and directing air flow along the tubing in the drawing direction of the tubing.

4,624,824

REACTOR VESSEL SEALING PLUG

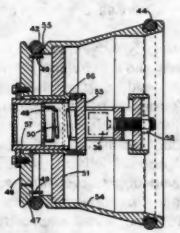
Ray A. Dooley, Rustburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 450,457, Dec. 15, 1982, abandoned.

This application Oct. 22, 1985, Ser. No. 789,364

Int. Cl.[4] G21C *19/04*, *19/20*

U.S. Cl. 376—204 7 Claims



1. An apparatus for sealing a cold leg nozzle of a nuclear reactor pressure vessel from a remote location comprising: at least one sealing plug for mechanically sealing the nozzle from the inside of the reactor pressure vessel, the sealing plug in-

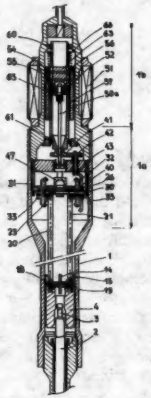
cluding a plate and a cone assembly having an end part receptive in the nozzle, the plate being axially moveable relative to the cone assembly, the plate and cone assembly having confronting bevelled edges defining an opening therebetween, a primary O-ring disposed about said opening and being supported on the bevelled edges, the plate being guidably mounted to the cone assembly for movement toward said cone assembly to radially expand the primary O-ring into sealing engagement with the nozzle, and means for providing relative movement between the outer plate and the cone assembly.

4,624,825

DIFFERENTIAL MOVEMENT CHAIN MECHANISM FOR CONTROLLING A NUCLEAR REACTOR

Jean Martin, Chatillon, and Claude LaFosse, Le Plessis-Robinson, both of France, assignors to Framatome, Courbevoie, France

Continuation of Ser. No. 201,084, Oct. 27, 1980, abandoned. This application Aug. 1, 1983, Ser. No. 518,326
Claims priority, application France, Oct. 31, 1979, 79 26996
Int. Cl.[4] G21C *7/14*
U.S. Cl. 376—227 **7 Claims**



1. In a nuclear reactor having a pressure vessel, a core in said vessel comprising a plurality of fuel assemblies each having vertically arranged fuel rods, and a plurality of control units having a cluster of neutron absorbing rods and an upper connecting part and each vertically movable between a lower position in which said cluster is in a position of maximum insertion in said core, and an upper position, a mechanism for individually moving one of said units, located within a casing sealingly connected to an upper portion of said vessel, said mechanism comprising

(a) a grab vertically movable along and within said casing, having a body and downwardly directed fingers pivotably connected to said body for movement between a closed condition for connection with said connecting part and an open condition for releasing said connecting part;

(b) carrier pulley means fixed on a horizontal shaft mounted for rotation on said body of said grab, operatively associated with said fingers such that rotation of said carrier pulley in one direction moves said fingers into closed position and rotation in the opposite direction moves said fingers into open position;

(c) chain means having two lifting portions supporting said carrier pulley means and having a driving connection therewith, so arranged that synchronous up or down movement of said two lifting portions causes vertical movement of said grab while differential movement of said lifting portions causes rotation of said carrier pulley means;

(d) each of said lifting portions passing over and being supported at the upper part of its course by a drive pulley carried by said casing; and

(e) a differential pinion apparatus for driving said drive pulleys, having

(i) a pair of pinions mounted for rotation about an axis fast with said casing and each drivably connected to one of said pulleys;

(ii) a support mounted for pivotal movement with respect to said casing between two extreme predetermined positions;

(iii) at least one driving pinion rotatably connected to said support and interconnecting both said pinions mounted for rotation about a fixed axis;

(iv) motor means for driving said pinions mounted for rotation about a fixed axis in synchronism; and

(v) movement means operationally connected to said movable support for maintaining the latter in a first of said extreme positions when energized and in the other of said extreme positions when de-energized;

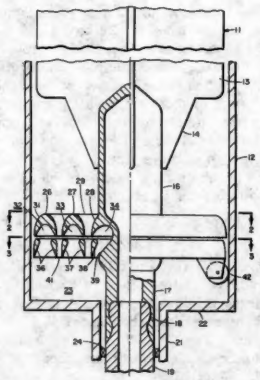
(vi) whereby de-energization of said movement means, whatever the vertical position of said grab, causes movement of said movable support from said first to said second extreme position and a differential rotative movement of said pinions mounted for rotation about a fixed axis and opening of said fingers for release and free fall of said cluster into said core.

4,624,826

CONTROL ROD VELOCITY LIMITER

James E. Cearley; John C. Carruth, both of San Jose; Robert C. Dixon, Morgan Hill, all of Calif.; Stephanie S. Spencer, and Jaime A. Zuloaga, Jr., both of Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 4, 1984, Ser. No. 646,761
Int. Cl.[4] G21C *7/20*; F16F *9/00*
U.S. Cl. 376—327 **12 Claims**



1. A velocity control arrangement for a reciprocable, vertically oriented control rod for use in a nuclear reactor in a fluid medium, said control rod including a drive hub secured to and extending from one end therefrom, a control device comprising: a toroidally shaped control member spaced from and coaxially positioned around said hub and secured thereto by a plurality of spaced radial webs thereby providing an annular passage for fluid intermediate the hub and the toroidal member spaced therefrom in coaxial position, the side of said control member toward said control rod having a smooth generally conical surface, the side of said control member away from

said control rod being formed with a concave surface constituting a single annular groove; inner and outer annular vanes radially spaced from one another and spaced from said side of said control member away from said control rod and positioned coaxially around and spaced from said hub and secured thereto by a plurality of spaced radial webs thereby providing an annular passage for fluid intermediate the hub and the vanes, said vanes being angled toward said control member, the outer edge of said inner vane being closer to said control member and the inner edge of said outer vane being closer to said control member whereby when said control rod moves in said fluid in the direction toward said drive hub said vanes direct a flow of fluid turbulence which provides greater resistance to movement of said control rod in the direction toward said drive hub than in the other direction.

4,624,827

NUCLEAR REACTOR CONTROL ROD HAVING A REDUCED WORTH TIP

Pratap K. Doshi, and John F. Wilson, both of Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1984, Ser. No. 633,774
Int. Cl.[4] G21C *7/10*
U.S. Cl. 376—333 **5 Claims**

1. In a nuclear reactor having a fuel assembly and a control rod movable in and out of the fuel assembly for controlling the reactivity of the reactor, the control rod comprising:

(a) an elongated tubular cladding;

(b) means for closing the opposite ends of said cladding;

(c) a first plurality of pellets of a first type disposed within said cladding in an end-to-end relationship; and

(d) a second plurality of pellets of a second type disposed within said cladding in an end-to-end relationship;

(e) one of said first and second types of pellets being formed of a material having a generally high neutron absorbing capacity;

(f) the other of said first and second types of pellets being formed of an inert material having a generally low neutron absorbing capacity;

(g) said pellets of said first and second pluralities thereof of said first and second types being cylindrical with their respective diameters being generally equal;

(h) said inert pellets being interspaced between said high neutron absorbing pellets at a lower end portion of said cladding with the remaining portion of said cladding above said lower end portion containing only said high neutron absorbing pellets;

(i) the axial heights of one of said first and second pluralities of pellets of said first and second types located at said lower end portion of said cladding progressively varying from pellet to pellet, whereas the axial heights of the other of said first and second pluralities of pellets of said first and second types located at said lower end portion of said cladding being generally equal from pellet to pellet, so as to produce an improved reduced worth tip at said lower end portion of said cladding.

4,624,828

METAL-ACTINIDE NITRIDE NUCLEAR FUEL

Carl A. Alexander, Grove City, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 29, 1983, Ser. No. 566,596
Int. Cl.[4] G21C *3/58*
U.S. Cl. 376—421 **6 Claims**

1. An improved refractory metal-uranium mononitride nuclear reactor fuel element for extended operation at high surface temperatures, comprising:

a. uranium mononitride; and

b. a nitride of a metal compatible with said uranium mononitride in which:

i. said metal nitride has a standard heat of formation from its elements at 25° C. of −60 to −90 kilo-cal/g mole;

ii. said metal has a melting point greater than that of uranium; and

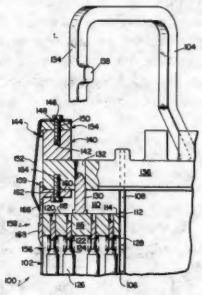
iii. said metal has a heat of vaporization less than that of uranium.

4,624,829

NUCLEAR FUEL ASSEMBLY CHANNEL SPRING AND STOP ASSEMBLY AND METHOD OF USING SAME

Leigh F. Jackson, Hempfield Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1984, Ser. No. 599,898
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—448 **15 Claims**



1. A channel spring and stop assembly for a nuclear fuel assembly having an upper fixture plate assembly and a flow channel member, said spring and stop assembly comprising:

(a) a bi-directional spring member comprising a pair of orthogonally disposed springs, extending generally downwardly from said fixture plate assembly and generally parallel to and adjacent said flow channel member;

(b) a spring adaptor member disposed between said bi-directional spring member and said fixture plate assembly for mounting said bi-directional spring member to said fixture plate assembly, said spring adaptor member having means for positively engaging said fixture plate assembly and said bi-directional spring member to prevent relative movement therebetween;

(c) a stop member, separate from said spring adaptor member and extending from said fixture plate assembly and protruding from said flow channel member.

4,624,830

MANUFACTURE OF ROTARY DRILL BITS

John D. Barr, Cheltenham, England, assignor to NL Petroleum Products, Limited, Stonehouse, England

Filed Nov. 30, 1984, Ser. No. 676,697
Int. Cl.[4] B22F *7/00*
U.S. Cl. 419—7 **27 Claims**

1. A method of manufacturing by a powder metallurgy

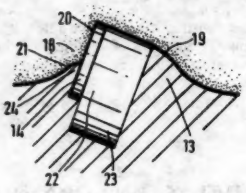
process a rotary drill bit including a bit body having a plurality of cutting elements mounted on the outer surface thereof, the method comprising the steps of:

a. forming a hollow mould for moulding at least a portion of the bit body;

b. positioning in spaced locations on the interior surface of the mould a plurality of cutting elements;

c. positioning a support material adjacent the rearward side of each cutting element;

d. packing the mould with powdered matrix material;



e. providing a metal alloy in contact with the powdered matrix material in the mould;

f. heating the packed mould in a furnace to an infiltration temperature at which the metal alloy fuses and infiltrates the powdered matrix material; and

g. cooling the mould to solidify the infiltrated matrix;

h. each cutting element being formed of a material which is thermally stable at said infiltration temperature; and

i. the support material, at least after formation of the solid infiltrated matrix, having a higher modulus of elasticity than that of the solid infiltrated matrix.

4,624,831

COMPOSITIONS OF MATTER AND THEIR MANUFACTURE

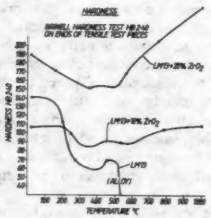
Norman Tommis, Bradford, England, assignor to Ae Plc, Warwickshire, England

Filed Aug. 12, 1985, Ser. No. 764,615

Claims priority, application United Kingdom, Aug. 13, 1984, 8420543

Int. Cl.[4] B22F *3/00*

U.S. Cl. 419—20 **7 Claims**



1. A method of manufacturing a composition of matter comprising:

preparing a melt of a material selected from the group of aluminium or aluminium alloy,

incorporating thereinto zirconia in an amount of from 5% to 50% by volume,

solidifying the matter so produced,

heat treating the solidified matter to produce a solid state reaction between the aluminium or aluminium alloy and the zirconia.

4,624,832

EYEGLASS FRAMES MADE OF NI ALLOY

Horst Heidsiek, Hanau; Gernot Jäckel, Hasselroth, and Horst Becker, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,891

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340054

Int. Cl.[4] C22C *19/03*

U.S. Cl. 420—442 **11 Claims**

1. An eyeglass frame or eyeglass part consisting essentially of 5 to 20 percent copper, 5 to 30 percent zinc, (a) 0 to 2 percent manganese, (b) 0 to 2 percent silicon, (c) 0 to 1 percent beryllium, and (d) at least one member of the group consisting of 0 to 4 percent each of aluminium, chromium, molybdenum, tungsten, vanadium, or titanium, the total amount of beryllium, aluminium, chromium, molybdenum, tungsten, vanadium, and titanium not exceeding 6 percent, and balance nickel.

4,624,833

LIQUID METAL ION SOURCE AND APPARATUS

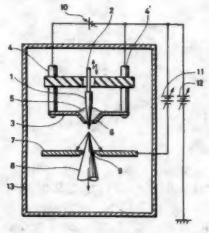
Kaoru Umemura, Kokubunji; Tohru Ishitani, Sayama; Toshiyuki Aida, Chofu, and Hifumi Tamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,771

Claims priority, application Japan, Nov. 28, 1983, 58-222033

Int. Cl.[4] H01J *1/05*

U.S. Cl. 420—490 **16 Claims**



1. In a liquid metal ion source wherein a source material which contains a predetermined element to be ionized is melted and fed to a tip of an emitter so as to produce an ion beam under a high electric field; a liquid metal ion source characterized in that said source material is a Cu alloy which contains P, the alloy containing P in an amount of at most 25 at. %.

4,624,834

DEVICE FOR MEASURING THE ABSOLUTE VALUE OF THE DENSITY OF SALTS IN ATMOSPHERE

Takaaki Fukumoto, Kishiwada, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,848

Claims priority, application Japan, Dec. 27, 1983, 58-246893; Jan. 6, 1984, 59-1051

Int. Cl.[4] B01K *3/02*

U.S. Cl. 422—90 **12 Claims**

1. A device comprising: means for measuring the absolute value of the density of salts in the atmosphere, including,

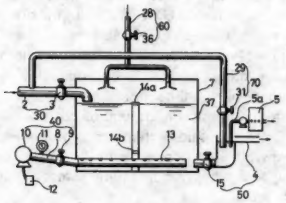
an airtight water tank containing super pure water;

means for supplying super pure water to said airtight water tank;

means for bubbling a predetermined quantity of air from the atmosphere into the predetermined quantity of super pure water, wherein said means for bubbling is provided in said airtight water tank;

means for exhausting the super pure water in said airtight water tank after the bubbling;

sodium ion analyzer means for measuring the density of sodium ions in the exhausted super pure water, wherein



said analyzer means has both a material taking inlet and outlet; and

background value measuring means for measuring the density of sodium ions in the super pure water at said means for supplying super pure water while bubbling.

4,624,835

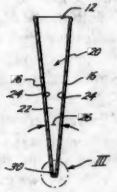
MICROCENTRIFUGATION TUBE FOR THE CONCENTRATION OF SAMPLES FOR ELECTRON MICROSCOPY

Charles P. Davis, and Robert Outenreath, both of Galveston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 414,630, Sep. 3, 1982, abandoned. This application Dec. 14, 1984, Ser. No. 682,573

Int. Cl.[4] B01L *3/14*; B04B *7/10*; C12M *1/24*; G01N *1/06*

U.S. Cl. 422—102 **4 Claims**



1. A microcentrifugation tube comprising a tube having an exterior surface, an open upper end, a closed lower end, and means defining a bore extending from the open upper end of the tube to the closed lower end of the tube, said means defining a bore including a lower tip and an upper section, said lower tip extending upwardly from the closed lower end of the tube about 1 millimeter and having a substantially constant trapezoidal horizontal cross-sectional shape that has a height of approximately 0.5 millimeters and bases of approximately 0.25 millimeters and approximately 0.12 millimeters, said upper section comprising inner walls which taper conically inwardly to said lower tip at an included angle of substantially 10°, and wherein the sizes and shapes of the lower tip and upper section are such that a cell population of a sample placed in said tube may be concentrated and the sample embedded in plastic to provide a finished polymeric plastic sample that is removable from the tube and has a shape to facilitate slicing the plastic sample with a microtome and minimize distortion of the plastic sample during slicing to thereby prepare the sample for examination under an electron microscope.

4,624,836

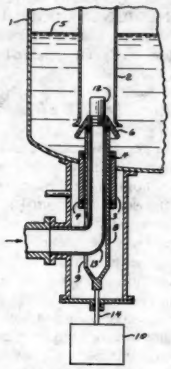
APPARATUS AND PROCESS FOR MIXING CRACKING CATALYST WITH A FLUID HYDROCARBON

Robert R. Cartmell, Crown Point, Ind., and Carl J. Horecky, Elmhurst, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 9, 1984, Ser. No. 629,070

Int. Cl.[4] C10G *11/18*

U.S. Cl. 422—115 **7 Claims**



1. An apparatus for immediately and intimately mixing fluidizable cracking catalyst with a fluid hydrocarbon feedstock, which comprises:

(a) a chamber containing said cracking catalyst;

(b) a riser reactor situated within said chamber having means defining an access opening at its upstream end for receiving said cracking catalyst and said feedstock;

(c) a stationary fluid feedstock feed means in fixed relationship with said access opening having: (i) an elongated feed tube extending generally upwardly through said access opening into said riser,

(d) a plug valve having: (i) a generally upright tubular valve stem positioned concentrically and externally around a portion of said feed tube, (ii) a hollow plug secured to said valve stem which is engageable with said access opening, said plug valve being movable in a reciprocating fashion from a closed position for blocking said access opening to an open position for permitting the flow of cracking catalyst from said chamber through said access opening into said riser reactor to mix with said feedstock; and

(e) a nozzle means secured to the downstream end of said feed means for injecting hydrocarbon feedstock into said riser.

4,624,837

PARTICULATES AND IRON CYANIDE COMPLEX REMOVAL

Daniel C. Baker, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1985, Ser. No. 814,707

Int. Cl.[4] B01D *45/00, 47/00*; C01C *3/00*; B03C *3/00*

U.S. Cl. 423—215.5 **8 Claims**

1. A process for scrubbing a synthesis gas stream containing residual amounts of iron containing particulate solids and minor amounts of HCN comprising

(a) contacting said synthesis gas stream with water in a contact zone and removing the particulate solids from the synthesis gas stream, producing an aqueous mixture containing solids and iron cyanide complex or complexes;

(b) contacting mixture from step (a) with a member selected from ammonium polysulfide, sodium polysulfide, and mixtures thereof, at a temperature of from 110° C. to 180°

C., in a contacting zone and converting iron cyanide complex or complexes in said mixture and producing a mixture having a substantially reduced iron cyanide complex or complexes content.

4,624,838

PROCESS FOR REMOVING ACIDIC GASES FROM GASEOUS MIXTURES USING AQUEOUS SCRUBBING SOLUTIONS CONTAINING HETEROCYCLIC NITROGEN COMPOUNDS

Yen-Chi Pan, Somerville, and David W. Savage, Lebanon, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 29, 1985, Ser. No. 728,410
Int. Cl.[4] C01B *17/14, 31/20*
U.S. Cl. 423—226 **18 Claims**

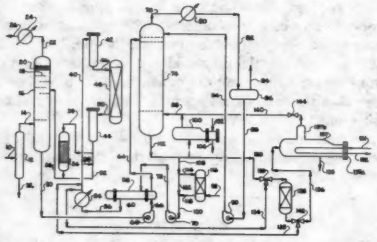
1. A process for removing acid gases selected from hydrogen sulfide and carbon dioxide from gaseous feeds which process comprises: contacting the feed with an aqueous scrubbing solution comprising water and 1 to 11 moles of a heterocyclic nitrogen compound per liter of solution which compound is selected from the group consisting of imidazole, a C_1–C_3 alkyl-substituted imidazole where the alkyl groups are bonded to at least one carbon atom, and a C_1–C_3 alkyl- or C_1–C_3 hydroxyalkyl-substituted piperazine where the alkyl or hydrozyalkyl groups are bonded to both nitrogen atoms of the ring, the compound having a pKa no greater than about 8, at conditions whereby acid gases are absorbed by said scrubbing solution.

4,624,839

PROCESS FOR THE RECOVERY OF CO_2 FROM FLUE GASES

Richard A. Wolcott, Angleton; Roscoe L. Pearce, Lake Jackson, both of Tex., and Charles R. Pauley, Chattanooga, Tenn., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 560,706, Dec. 12, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 702,961
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—228 **33 Claims**



1. In a process for the recovery of carbon dioxide from feed gases containing the same and oxygen, which may also contain sulfur compounds, by contacting the gas with a circulating alkanolamine solution containing copper as an inhibitor, to absorb the CO_2 and thereafter treating said solution rich and CO_2 with heat to release the CO_2 thereby producing a hot lean solution and returning the so treated lean solution after cooling to the contacting step, the improvement which comprises

maintaining an amount of copper in said circulating solution effective to inhibit corrosion and/or degradation of the solvent

(a) by contacting all or a portion of said cool lean circulating solution with at least one of the following

(1) at least one mechanical filter;
(2) activated carbon bed;
(3) strong base anion exchange resin; and/or
(4) any combination thereof; and

(b) by

(1) withdrawing a portion of the hot lean solution after the release of the CO_2 by heat and, prior to cooling and/or contact with (a)(1), (2) and/or (3), treating said withdrawn hot portion by passing it through a carbon bed independant of (a)(2) to reduce the dissolved ionic cooper in the hot solution;
(2) stopping said withdrawal of hot lean solution;
(3) contacting said carbon bed with cool lean solution to redissolve the copper from the carbon bed and returning said copper containing lean cool solution to the absorber.

17. In a process for the recovery of carbon dioxide from feed gases containing the same and oxygen, which may also contain sulfur compounds, by contacting the gas with a circulating alkanolamine solution, containing copper as an inhibitor, and treating said solution rich in CO_2 with heat to release the CO_2 thereby thereby producing a lean solution and returning the so treated lean solution, after cooling, to the contacting step, the improvement which comprises

maintaining at least 5 parts of copper per million parts solution in said circulating solution;

(a) by contacting all or a portion of said cool lean circulating solution with at least one of the following

(1) at least one mechanical filter;
(2) activated carbon bed;
(3) strong base anion exchange resin; and/or
(4) any combination thereof; and

(b) by

(1) withdrawing a portion of the hot lean solution after the release of the CO_2 by heat and, prior to cooling and/or contact with (a)(1), (2) and/or (3), treating said withdrawn hot portion by passing it through a carbon bed independant of (a)(2) to reduce the dissolved ionic copper in the hot solution;
(2) stopping said withdrawal of hot lean solution;
(3) contacting said carbon bed with cool lean solution to redissolve the copper from the carbon bed and returning said copper containing lean cool solution to the absorber.

33. In a process for the recovery of carbon dioxide from feed gases containing the same and oxygen, which may also contain sulfur compounds, by contacting the gas with a circulating liquid aqueous 5 to 80% by weight alkanolamine solution, containing copper as an inhibitor and treating said solution rich in CO_2 with heat to release the CO_2 thereby producing a hot lean solution and returning the so treated lean solution, after cooling, to the contacting step, the improvement which comprises

maintaining at least 5 parts of copper per million parts solution in said circulating solution;

(a) by contacting all or a portion of said cool lean circulating solution with at least one of the following

(1) at least one mechanical filter;
(2) activated carbon bed;
(3) strong base anion exchange resin: and/or
(4) any combination thereof; and

(b) by

(1) withdrawing a portion of the hot lean solution after the release of the CO_2 by heat and, prior to cooling and/or contact with (a)(1), (2) and/or (3), treating said withdrawn hot portion by passing it through a carbon bed independant of (a)(2) to reduce the dissolved ionic copper in the hot solution;
(2) stopping said withdrawal of hot lean solution;

(3) contacting said carbon bed with cool lean solution to redissolve the copper from the carbon bed and returning said copper containing lean cool solution to the absorber.

4,624,840

NON-CATALYTIC METHOD FOR REDUCING THE CONCENTRATION OF NO IN COMBUSTION EFFLUENTS BY INJECTION OF AMMONIA AT TEMPERATURES GREATER THAN ABOUT 1300° K.

Anthony M. Dean, Hampton; Anthony J. DeGregoria, Flemington; James E. Hardy, Lebanon; Boyd E. Hurst, Long Valley, and Richard K. Lyon, Pittstown, all of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 550,398, Nov. 10, 1983, Pat. No. 4,507,269. This application Mar. 22, 1985, Ser. No. 714,965

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[4] C01B *21/00*; B01J *8/00*

U.S. Cl. 423—235 **9 Claims**

1. A process for reducing NO concentration of a combustion effluent containing NO and at least 0.1 volume percent oxygen when at least a portion of the combustion effluent is at a temperature within the range of about 1300° K. to about 1600° K. which process comprises injecting ammonia into the combustion effluent, in a cooling zone wherein the combustion effluent is cooling at a rate of at least about 250° K. per second wherein the amount of ammonia and the point of injection are determined by the solution of a set of simultaneous equations derived from the kinetic model:

Rate constant $K = AT^n \exp(-E/(1.98)T)$

REACTION	A	n	E
$NH_3+O=NH_2+H_2$	.246E+14	0.0	17071.
$NH_3+O=NH_2+OH$	.150E+13	0.0	6040.
$NH_3+OH=NH_2+H_2O$	.326E+13	0.0	2120.
$HNO+M=NO+H+M$	.186E+17	0.0	48680.
$HNO+OH=NO+H_2O$	.360E+14	0.0	0.
$NH_2+HNO=NH_3+NO$	.175E+15	0.0	1000.
$NH_2+NO=NNH+OH$	.610E+20	−2.46	1866.
$NH_2+O_2=HNO+OH$	.510E+14	0.0	30000.
$NNH+NH_2=N_2+NH_3$	.100E+14	0.0	0.
$NH_2+O=NH+OH$	.170E+14	0.0	1000.
$NH_2+OH=NH+H_2O$	.549E+11	0.68	1290.
$NH_2+H=NH+H_2$	.500E+12	0.5	2000.
$NH+O_2=NHO+O$	.300E+14	0.0	3400.
$H_2+OH=H_2O+H$	.220E+14	0.0	5150.
$H+O_2=OH+O$	.220E+15	0.0	16800.
$O+H_2=OH+H$	.180E+11	1.0	8900.
$H+HO_2=OH+OH$	.250E+15	0.0	1900.
$O+HO_2=O_2+OH$	.480E+15	0.0	1000.
$OH+HO_2=H_2O+O_2$	.500E+14	0.0	1000.
$OH+OH=O+H_2O$	.630E+13	0.0	1090.
$HO_2+NO=NO_2+OH$	.343E+13	0.0	−260.
$H+NO_2=NO+OH$	.350E+15	0.0	1500.
$O+NO_2=NO+O_2$	.100E+14	0.0	600.
$H+O_2+M=HO_2+M$ $H_2O/21$**	.150E+16	0.0	−995.
$NNH+M=N_2+H+M$	.200E+15	0.0	30000.
$NO_2+M=NO+O+M$	.110E+17	0.0	66000.
$NH_3+M=NH_2+H+M$	.480E+17	0.0	93929.
$O+O+M=O_2+M$	.138E+19	−1.0	340.
$NH_2+NO=N_2+H_2O$	.910E+20	−2.46	1866.
$NNH+OH=N_2+H_2O$	.300E+14	0.0	0.
$NNH+NO=N_2+HNO$	.906E+12	0.0	0.

**i.e. $A=21 \times .15E+16$ for H_2O as "third body".

4,624,841

PROCESS FOR REFINING AN AMMONIA SYNTHESIS GAS

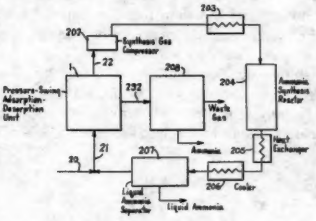
Morihisa Hidaki, Chiba, Japan, assignor to Toyo Engineering Corporation, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,491

Claims priority, application Japan, Jan. 23, 1984, 59-9697; Mar. 8, 1984, 59-44290; Oct. 30, 1984, 59-228721

Int. Cl.[4] C01C *1/04*

U.S. Cl. 423—359 **29 Claims**



1. In a process for refining an ammonia synthesis gas comprising the steps of:

(a) subjecting a hydrocarbon raw material to a primary steam reforming reaction under pressure;

(b) subjecting the resulting gas from the step (a) to a secondary steam reforming reaction by feeding air into said resulting gas;

(c) subjecting carbon monoxide in the resulting gas from the step (b) to a catalytic carbon monoxide shift conversion reaction;

(d) removing carbon oxides from the gas obtained by the step (c) to produce an ammonia synthesis gas containing nitrogen and hydrogen:

(e) subjecting said ammonia synthesis gas to an ammonia synthesis reaction to produce ammonia and feeding the ammonia synthesis gas that contains produced ammonia to an ammonia separator unit to separate ammonia from the remaining ammonia synthesis gas; and

(f) circulating said remaining ammonia synthesis gas separated from ammonia to the step (e), the improvement which comprises:

(A) in step (b), feeding said air in excess of the amount of air equivalent to the nitrogen stoichiometrically required for the synthesis of ammonia;

(B) in either step (d) or step (e), treating the ammonia synthesis gas in an adsorption-desorption unit to remove excess nitrogen as well as non-ammonia-producing gaseous components and, in the case of the synthesis gas of step (e), ammonia, from the ammonia synthesis gas, the amount of nitrogen that is removed being so regulated that the hydrogen-to-nitrogen ratio in the ammonia synthesis gas is the stoichiometric ratio required for the synthesis of ammonia and wherein the treatment in said adsorption-desorption unit comprises:

(i) feeding said ammonia synthesis gas to a first adsorption bed which is saturated with adsorbed nitrogen, thereby causing said first bed to adsorb water vapor, carbon dioxide, carbon monoxide, methane and argon contained in said ammonia synthesis gas and to desorb the nitrogen previously adsorbed on said first bed while allowing gases of hydrogen and nitrogen to flow out of said first bed;

(ii) feeding a portion of the gas flowing out of said first bed into a succeeding downstream second adsorption bed which has undergone desorption and repressurization steps, thereby to adsorb nitrogen contained in said portion of said gas fed therein and flowing substantially pure hydrogen from said second bed; and

(iii) when said succeeding downstream second adsorption

bed becomes saturated with adsorbed nitrogen, switching said first bed undergoing the step (i) to undergo a subsequent desorption step, switching said succeeding downstream second bed to simultaneously undergo the step (i), and simultaneously switching a further succeeding adsorbent bed which has undergone desorption and repressurization to undergo the step (ii), thereby cyclically continuing adsorption;

(iv) combining the gas discharged from said further succeeding downstream bed undergoing the step (ii) with the portion of the gas which has been discharged from said bed undergoing the step (i) but has not been sent to said further succeeding downstream bed undergoing the step (ii) whereby to form an ammonia synthesis gas, while controlling the flow rates of both said gases so that the hydrogen-to-nitrogen ratio in the ammonia synthesis gas can be adjusted to a predetermined value nearest to the stoichiometric ratio required for the synthesis of ammonia.

4,624,842

TEMPERATURE CONTROLLED AMMONIA SYNTHESIS PROCESS

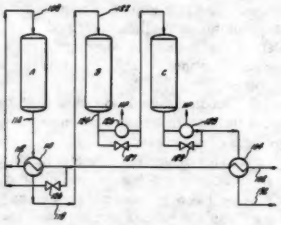
Bernard J. Grotz, Jr., Pasadena, Calif., assignor to C. F. Braun & Co., Alhambra, Calif.

Continuation-in-part of Ser. No. 444,720, Nov. 26, 1982, Pat. No. 4,510,123. This application Apr. 8, 1985, Ser. No. 720,593

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] C01C *1/04*

U.S. Cl. 423—360 **6 Claims**



1. A process for the synthesis of ammonia carried out at a pressure greater than 100 atmospheres which process comprises passing a mixture of gases in continuous flow through apparatus so as to carry out the following steps:

(a) passing at least a portion of an ammonia feed syngas through a heat exchanger to increase its temperature;

(b) passing said feed syngas from (a) through a first ammonia synthesis catalyst bed to obtain an effluent;

(c) passing at least a portion of the effluent from (b) through the heat exchanger of (a) to decrease the temperature of said effluent;

(d) passing the effluent from (c) through a series of at least two additional ammonia synthesis catalyst beds and then subsequent to each bed through a high temperature heat sink to decrease the temperature of the effluent and to obtain a final product effluent; and

(e) recovering ammonia from the final product effluent of the series in (d).

4,624,843

RECOVERY OF CHLORINE

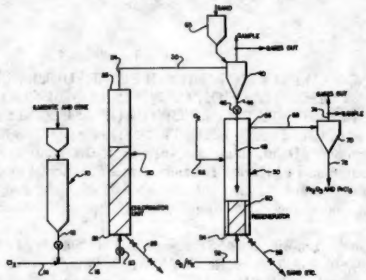
Michael Robinson, Wooton, England, assignor to SCM Chemicals Limited, London, England

Filed Jun. 10, 1985, Ser. No. 743,055

Claims priority, application United Kingdom, Jun. 13, 1984, 8415034

Int. Cl.[4] C01G *49/10*

U.S. Cl. 423—493 **20 Claims**



1. In a process for recovering chlorine in a fluidized bed chlorination process for chlorinating iron-containing metalliferous oxidic materials where the fluidized bed chlorination step produces residues of iron chloride and blow-over carbon, the improvement comprising:

providing a blend of two or more iron-containing metalliferous oxidic materials selected from the ores of rutile, ilmenite, bauxite, chromite, wolframite, scheelite, tantalite, and columbite, wherein the blend of oxidic materials contains between 10% and 35% by weight iron oxide;

chlorinating the blend of metalliferous oxidic materials with recycled chlorine in the presence of excess carbon at temperatures between about 500° C. and 1050° C. to produce metal chlorides including iron chloride;

removing vaporous iron chloride and a quantity of blow-over carbon in an effluent stream from the chlorination step in a weight ratio of blow-over carbon to iron chloride of 1:3 to 1:14 where said weight ratio is controlled by the iron oxide content in said blend relative to said excess carbon;

condensing said vaporous iron chloride tc form a condensed effluent stream;

regenerating chlorine from said condensed effluent stream by reacting said effluent stream containing condensed iron chloride and blow-over carbon with an oxygen containing gas containing excess oxygen beyond the quantity required (a) to combust the blow-over carbon and oxidize at least a portion of the iron chlorides to (b) maintain a reaction temperature from 500° C. to 1050° C., (c) to produce a recycle stream containing 30% to 50% chlorine gas and

recycling said recycle stream to said blend chlorination step.

4,624,844

PROCESS FOR PRODUCING AMMONIUM PARATUNGSTATE

Richard A. Scheithauer; Clarence D. Vanderpool; Martin B. MacInnis, and Michael J. Miller, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 4, 1985, Ser. No. 697,662

Int. Cl.[4] C01G *41/00*

U.S. Cl. 423—593 **7 Claims**

1. A process for producing ammonium paratungstate, said process comprising:

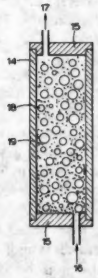
(a) adding hexamethylenetetramine to a first ammonium tungstate solution;
(b) adjusting the pH of the resulting hexamethylenetetramine treated ammonium tungstate solution to about 2 with an acid to form a first precipitate which contains the major portion of the tungsten and the hexamethylenetetramine and a first mother liquor;
(c) separating said first precipitate from said first mother liquor;
(d) dissolving said first precipitate in aqueous ammonia to form a second ammonium tungstate solution containing hexamethylenetetramine;
(e) heating said second ammonium tungstate solution at from about 90° C. to about 100° C. to form a second precipitate essentially all of which is ammonium paratungstate and a second mother liquor which contains essentially all of the hexamethylenetetramine; and
(f) separating said second precipitate from said second mother liquor.

4,624,845

PROCESS FOR PREPARING AN IRON OXIDE

Roy D. Laundon, 2 Barn Meadow Lane, Great Bookham, Leatherhead, Surrey; Anthony J. Wickens, 8 Oaks Way, Surbiton, Surrey, and John H. W. Turner, Cornerstones, Cockyard, Chapel-en-le-Frith Via Stockport, Cheshire, all of England

Filed Feb. 22, 1984, Ser. No. 582,332
Claims priority, application United Kingdom, Feb. 24, 1983, 8305145; Feb. 24, 1983, 8305146
Int. Cl.⁴ C01G *49/06, 49/10*
U.S. Cl. 423—633 **22 Claims**



1. A combined process for the preparation of micaceous iron oxide which comprises providing in a single reactor at an elevated temperature: metallic iron, a volatility-suppressing salt selected from the group consisting of at least one salt of an alkali metal or alkaline earth metal, and an iron chloride starting material, the elevated temperature being sufficient to maintain iron chloride and the volatility-suppressing salt in a mixed salt-iron chloride molten phase; oxidizing the iron chloride with oxygen or an oxygen-containing gas to form chlorine and a micaceous iron oxide; and permitting the chlorine thus formed to react with metallic iron in the reactor to form a further salt-iron chloride molten phase; and recovering the micaceous iron oxide thus formed, the chlorine being reused sequentially to react with at least a portion of any remaining metallic iron.

4,624,846

METHOD FOR ENHANCING TARGET SPECIFICITY OF ANTIBODY LOCALIZATION AND CLEARANCE OF NON-TARGET DIAGNOSTIC AND THERAPEUTIC PRINCIPLES

Milton D. Goldenberg, Short Hills, N.J., assignor to Immunomedics, Inc., Newark, N.J.

Continuation of Ser. No. 518,713, Jul. 29, 1983, abandoned. This application Jul. 24, 1984, Ser. No. 633,999
Int. Cl.⁴ A61K *43/00, 49/00, 39/00, 49/02;* A61N *5/10*
U.S. Cl. 424—1.1 **17 Claims**

1. In a method for determining the location of a tumor which produces or is associated with a cytoplasmic, intracellular or cell-surface marker substance, which comprises injecting a human subject parenterally with a marker-specific antibody or antibody fragment labeled with a pharmacologically inert radioisotope capable of detection using a photoscanning device, or with a paramagnetic conjugate capable of detection with a magnetic resonance detector, and subsequently scanning with said device or detector to detect and locate the site or sites of uptake of said labeled antibody or antibody fragment by said tumor,

the improvement comprising injecting said subject parenterally, at a time after injection of the marker-specific antibody or fragment sufficient to permit maximum selective uptake thereof by said tumor, and prior to scanning, with a second, non-labeled antibody or antibody fragment specific against said marker-specific antibody or fragment, in an amount sufficient to decrease the level of circulating labeled marker-specific antibody or fragment by 10–85% within 2–72 hours.

4,624,847

DRUG DELIVERY DEVICE FOR PROGRAMMED DELIVERY OF BENEFICIAL DRUG

Atul D. Ayer, Mt. View, and Brian Barclay, Sunnyvale, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Apr. 22, 1985, Ser. No. 725,839
Int. Cl.⁴ A61M *31/00, 7/00*
U.S. Cl. 424—15 **22 Claims**

1. A dispensing device for delivering a beneficial medicine formulation to an environment of use, comprising:
(a) a wall comprising in at least a part of a semipermeable composition permeable to the passage of an exterior fluid present in the environment of use and substantially impermeable to the passage of a beneficial medicine formulation, the wall surrounding and forming;
(b) a compartment;
(c) means in the compartment for increasing in size from a rested state to an expanded state for occupying more volume of the compartment;
(d) a medicine formulation in the compartment substantially coated around the means; and,
(e) means in the wall connecting the exterior of the device with the compartment for delivering the medicine from the device over time.

4,624,848

ACTIVE AGENT CONTAINING HYDROGEL DEVICES WHEREIN THE ACTIVE AGENT CONCENTRATION PROFILE CONTAINS A SIGMOIDAL CONCENTRATION GRADIENT FOR IMPROVED CONSTANT RELEASE, THEIR MANUFACTURE AND USE

Ping I. Lee, Berwyn, Pa., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 10, 1984, Ser. No. 608,756
Int. Cl.⁴ A61K *9/26, 31/74*
U.S. Cl. 424—22 **12 Claims**

1. An active agent containing controlled release diffusion device comprising a swellable hydrogel matrix in the non-swollen state, interpenetrated with an active agent solute having a stable concentration distribution increasing in a gradient

normal to the surface of th device and between the surface and the core thereof, said gradient being in the form of a substantially continuous, inflection point containing, sigmoidal curve, wherein the core is substantially uniformly loaded with active agent and extends outwardly from the center of the device to about 1 to about 60 percent of the radius of the device; the sigmoidal concentration gradient of the active agent extending gradient of the active agent extending outwardly from said core to cover about 99 to about 30 percent of the radius of the device, the remainder, up to about 10 percent of the outermost portion of the radius to the surface of the device, contains a concentration of active agent of no more than 10 weight percent per unit volume as compared to the core concentration of active agent, such that the device, when placed in an aqueous hydrogel swelling environment, releases said active agent in a controlled continuous manner by diffusion for a predetermined period of time into said aqueous environment.

4,624,849

ANTIMICROBIAL LOZENGES

Kevin C. Toogood, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 2, 1984, Ser. No. 667,678
Int. Cl.[4] A61K *7/22, 9/20, 31/74*
U.S. Cl. 424—78 **8 Claims**

1. A non-cariogenic lozenge consisting essentially of from about 0.02% to about 1% of a cationic antimicrobial, from about 0.1% to about 4% of a nonionic lubricant selected from the group consisting of polyethylene glycols, hydrogenated tallow, hydrogenated vegetable oil and mixtures thereof and from about 85% to about 99.8% of a filler selected from the group consisting of mannitol, sorbitol, xylitol, polyethylene glycol, non-cariogenic dextrans and mixtures thereof, wherein said lozenge is substantially free of magnesium stearate.

4,624,850

LIVE ATTENUATED HUMAN ROTAVIRUS VACCINE

Manuel J. Albert, Keilor; Graeme L. Barnes, Kew East, and Ruth F. Bishop, Brighton, all of Australia, assignors to Royal Children's Hospital Research Foundation, Parkville, Australia

Filed Feb. 8, 1985, Ser. No. 699,717
Int. Cl.[4] A61K *39/12*
U.S. Cl. 424—89 **3 Claims**

1. A vaccine for providing immunological protection against acute diarrhea caused by human rotavirus, which comprises a live attenuated strain of the virus designated Hu/Australia/10-25-10/77/L ATCC number VR2104, in admixture with a suitable carrier.

2. A vaccine for providing immunological protection against acute diarrhea caused by human rotavirus, which comprises a live attenuated strain of the virus designated HU/Australia/1-9-12/77/S ATCC no. VR2105 in admixture with a suitable carrier.

3. A vaccine for providing enhanced immunological cross-protection against acute diarrhea caused by human rotavirus which comprises live attenuated strains of HU/Australia/1-9-12/77/S, ATCC no. VR2105 and HU/Australia/10-25-10/77/L, ATCC no. VR2104.

4,624,851

TREATMENT OF SYMPTOMS OF NEOPLASTIC DISEASES

Emanuel Revici, New York, N.Y., assignor to Elena Avram, New York, N.Y.

Continuation of Ser. No. 487,901, Apr. 22, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 714,359
Int. Cl.[4] A61K *33/42, 33/16, 31/19, 31/20*
U.S. Cl. 424—128 **11 Claims**

7. A method for obtaining subjective improvements in the treatment of symptoms of cancer in a human or lower animal subject without treating the cancer which comprises administering to said subject between about 100 mcg to 50 mg daily of a perfluorobutyric acid, perfluorooctanoic acid, perfluoropropionic acid, perfluorosuccinic acid, hexafluorophosphoric acid, fluorobenzoic acid, fluoromethylbenzoic acid, fluorosulfuric acid, or pharmaceutically acceptable salt thereof.

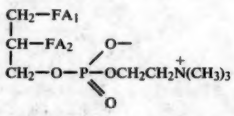
4,624,852

PROCESS AND COMPOSITION FOR TREATING NEUROLOGICAL DISORDERS AND AGING

Richard J. Wurtman, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 495,202, May 15, 1983, abandoned. This application May 21, 1984, Ser. No. 613,000
Int. Cl.[4] A61K *31/40, 31/195, 31/685*
U.S. Cl. 514—77 **10 Claims**

1. The process for relieving the adverse effects of neurological disease or aging in a patient, which comprises administering a composition comprising (a) tryptophans and (b) an amount of a compound effective to raise the blood stream choline level of a patient to between about 10 and 50 nanomoles/ml and to release adequate amount of brain acetylcholine selected from the group consisting of choline, a choline salt, a choline ester, sphingomyelin, cytidine-diphospho-choline and an acylglycerocholine of the formula:



wherein FA_1 and FA_2 can be the same or different and are fatty acid residues having from 6–26 carbon atoms, and mixtures thereof.

4,624,853

INSTANT YOGURT FOOD PRODUCT

Richard E. Rudin, Kenosha County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 464,178, Feb. 7, 1983, abandoned. This application Jan. 8, 1986, Ser. No. 816,912
Int. Cl.[4] A23C *9/12;* **A23L** *1/04*
U.S. Cl. 426—61 **6 Claims**

1. A freeflowing dry food composition to be reconstituted into a yogurt-like product by mixing with liquid comprising from about 0.005 to 10% by weight of at least one yogurt producing bacteria; from about 0.5 to 20% by weight of a viscosity control agent selected from the group consisting of a gum or a mixture of gums; from about 4 to 60% by weight of a modified pregelatinized starch which is dispersible in liquids without agglomeration, said starch consisting essentially of from about 99.0 to 99.95% by weight of a pregelatinized starch selected from the group consisting of tapioca starch, corn starch, wheat starch, potato starch, rye starch and mixtures thereof, and from about 0.05 to 1.0% by weight of a food grade emulsifier selected from the group consisting of a mixture of distilled propylene glycol monoesters, distilled monoglycerides, and sodium stearoyl lactylate wherein the emulsifier substantially coats and encapsulates the starch to prevent agglomeration when added to liquids and to form a thin coating such that upon minimal agitation the starch is dispersed throughout a liquid medium to which it is added and thicken and set liquid medium, sufficient edible acid to produce a pH of from about 3.7 to 4.7; from about 10% to 90% by weight of a sweetener; from about 0.5 to 16% by weight of a powdered oil; from about 0.1 to 25% by weight of a flavoring agent; and from about 0.1 to 3% by weight of a salt.

4,624,854

CONTINUOUS METHOD OF STERILIZING FOODSTUFFS

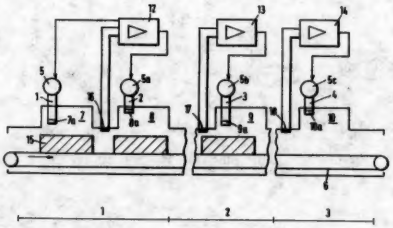
Gerd Naumann, Langenhagen, and Gerhard Syrbius, Grossburgwedel, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 23, 1985, Ser. No. 768,569

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432341

Int. Cl.[4] G01N *33/02;* A23L *3/18;* H05B *6/64*

U.S. Cl. 426—233 3 Claims



1. A continuous method of sterilizing foodstuffs utilizing microwave energy comprising the steps of locating the foodstuff to be sterilized on an endless conveyor belt, sequentially conveying said foodstuff on said belt throuh a plurality of microwave treatment stages, each said stage comprising at least one microwave treatment chamber, supplying microwave energy to each said treatment chamber to sterilize said foodstuff, monitoring the temperature of said foodstuff in each said stage, and reducing the amount of microwave energy supplied, in a stepwise manner, from stage to stage, in dependence upon the monitored temperature in each stage.

4,624,855

PROCESS FOR MAKING ROLLED WAFER CONES

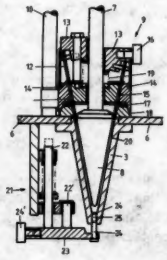
Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Australia

Filed Apr. 25, 1985, Ser. No. 727,006

Claims priority, application Austria, May 4, 1984, 1491/84

Int. Cl.[4] A21C *15/02;* A21D *13/00*

U.S. Cl. 426—501 6 Claims



1. A process for making a rolled wafer cone having an upper open, circular cone rim and a lower closed cone tip, comprising the steps of

(a) baking a sugar-containing wafer dough to form a flat wafer blank having a closed edge around the blank,

(b) delivering the baked flat wafer blank in a plastically deformable state to a winding mold,

(c) rolling the wafer blank in the plastically deformable state in the winding mold to form a wafer cone of a configuration determined by the winding mold while leaving the closed wafer blank edge unrestrained and a portion of the unrestrained closed wafer blank edge forms the upper cone rim,

(d) plastically deforming the formed upper cone rim until the plastic deformation produces a cone of an exactly defined, upper open circular cone rim and an exactly defined length between the cone rim and tip, and

(e) permitting the cone having the exactly defined upper rim and the exactly defined length to harden.

4,624,856

METHOD AND COMPOSITION FOR SOFT EDIBLE BAKED PRODUCTS HAVING IMPROVED EXTENDED SHELF-LIFE AND AN EDIBLE FIRM GEL FOR USE THEREIN

Fred Vanderveer, Mahwah; Aloysius Knipper, Ringwood; Robert Straka, Pequannock, and Alex J. Squicciarini, Fair Lawn, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 580,365, Feb. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 293,924, Aug. 18, 1981, Pat. No. 4,444,799. This application Mar. 15, 1985, Ser. No. 712,206

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.[4] A21D *10/00;* A23L *1/04*

U.S. Cl. 426—549 41 Claims

1. A method for making an edible firm gel composition capable of being ground for producing soft-textured baked products from a dough, comprising mixing:

(a) an edible viscous liquid;

(b) from about 0.25 to about 4 parts by weight of an edible gum capable of being set by calcium ions, and

(c) from about 0.1 to about 4 parts by weight of a calcium ion source for setting said gum,

said parts by weight being based upon 100 parts by weight of said edible viscous liquid, said mixing being under mixing conditions to substantially avoid the initial formation of lumps and to form a substantially homogeneous, lump-free blend.

4,624,857

METHOD FOR AUTOMATIC CONTROL OF GALVANIC DEPOSITION OF COPPER COATINGS IN GALVANIC ACID COPPER BATHS

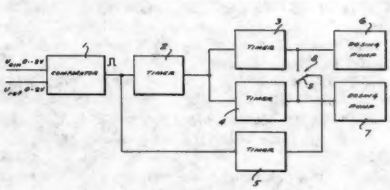
Wolfgang Dahms, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 698,422

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3404267

Int. Cl.[4] C25D *3/38*

U.S. Cl. 427—8 10 Claims



1. In a method for a full-automatic control of the galvanic deposition of copper coatings in acid galvanic baths by measuring a maximal current density and a continual automatic addition of dosed gloss additives and a determination of deviations of an actual voltage from a nominal voltage value, the im-

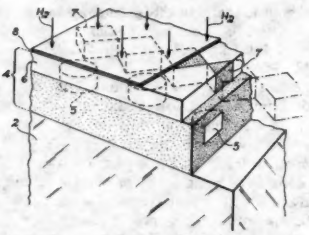
provement comprising the steps of measuring the maximal current density by cyclically measuring an actual voltage, and eventually compensating for deviations of the actual voltage from the nominal value by means of electronic dosing devices, wherein a function generator is used in said measuring step, said function generator cyclically varying a potential between a reference electrode and a rotating platinum disc electrode between voltage points −0.2 V and +1.8 V and with a velocity of 100 m V/sec.

4,624,858

PROCESS FOR THE PRODUCTION BY CATALYSIS OF A LAYER HAVING A HIGH MAGNETIC ANISOTROPY IN A FERRIMAGNETIC GARNET

Thierry Capra, Lyons, and Philippe Gerard, St. Ismier, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 23, 1985, Ser. No. 790,459
Claims priority, application France, Nov. 12, 1984, 84 17199
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 6 Claims



1. A process for producing a complete structure of a ferrimagnetic garnet layer having a high magnetic anisotropy on an amagnetic structure, comprising the stages of:

(a) forming at least one ferrimagnetic garnet layer by epitaxy on the amagnetic substrate;

(b) implanting ions in the ferrimagnetic garnet layer in order to produce defects therein;

(c) depositing on the ferrimagnetic garnet layer a metal layer which is able to activate and diffuse hydrogen into said garnet layer; and

(d) heating said complete structure under a hydrogen atmosphere, in order to bring about the diffusion of hydrogen into the ferrimagnetic garnet layer.

4,624,859

METHOD OF PRODUCING SILICON DIOXIDE FILMS

Shuhara Akira; Yamanishi Kenichiro, and Minowa Yoshibumi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP84/00274, § 371 Date Jul. 10, 1985, § 102(e) Date Jul. 10, 1985
PCT Filed May 28, 1985, Ser. No. 758,223
Int. Cl.[4] B05D 3/06, 5/12
U.S. Cl. 427—38 27 Claims

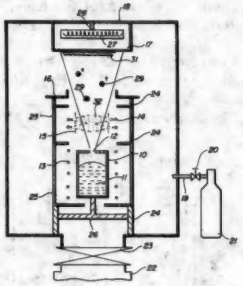
1. A method of producing silicon dioxide films comprising:

a first step of heating a material comprising silicon or siiicon oxides to vaporize said material;

a second step of ionizing or exciting said vaporized material; and

a third step of accelerating the ionized material so that it collides with the surface of a substrate;

conducting said first, second and third steps in a vacuum container having an ambient gas consisting mainly of oxygen atoms to thereby enable silicon dioxide to be



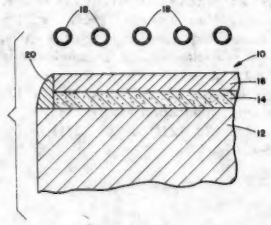
vapor-plated on the substrate to a predetermined thickness.

4,624,860

METHOD OF APPLYING A COATING TO A METAL SUBSTRATE USING BRAZING MATERIAL AND FLUX

Norman E. Alber, Mentor; Manek R. Dustoor, Cleveland Heights; Edward K. Hellier, Parma Heights, and Vito N. Scotese, Mayfield Heights, all of Ohio, assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Oct. 15, 1985, Ser. No. 787,132
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—46 9 Claims



1. A method of applying a coating material to a metal substrate wherein the properties of the substrate material need be precisely controlled which method comprises

providing a substrate which is to be coated with coating material;

supplying a brazing material adapted to come into contact with and coat at least a part of the substrate;

positioning a sheet of coating material distributed in a polytetrafluoroethylene fibrous material in close proximity to said substrate;

providing flux to said braze and coating materials and said substrate;

heating said flux, coating and braze materials and said article wherein said heating is sufficient to start the melting of the braze material and provide for wetting of said substrate and is done by an induction generator so as to provide for only heating surface portions of the substrate; and

cooling said substrate and flux, coating and braze materials, thereby bonding said coating material to said substrate.

4,624,861

RARE EARTH OXYSULFIDE PHOSPHORS AND PROCESSES FOR CREATING SAME

Ramon L. Yale, Ulster, and Nelson W. Shearer, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 5, 1985, Ser. No. 772,811
Int. Cl.[4] B05D 5/06, 5/12, 7/00; C09K 11/08
U.S. Cl. 427—65 19 Claims

1. A process for creating a rare earth oxysulfide x-ray phosphor comprising:

(a) wet milling a material comprising a rare earth oxysulfide to deagglomerate said material;

(b) removing soluble impurities from the resulting deagglomerated material;

(c) drying the resulting essentially purified material;

(d) forming a relatively uniform admixture comprising the dried material and aluminum oxide with the aluminum oxide content being from about 0.1 to about 1.0 weight percent of said admixture; and

(e) heating said admixture at a sufficient temperature for a sufficient time to form said phosphor.

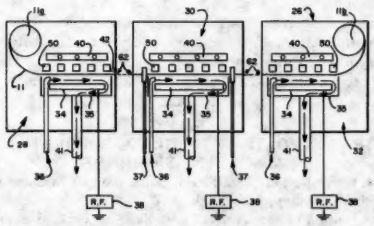
5. A process of claim 1 comprising the additional step of coating the rare earth oxysulfide with a silicate coating prior to formation of the admixture.

4,624,862

BORON DOPED SEMICONDUCTOR MATERIALS AND METHOD FOR PRODUCING SAME

Chi C. Yang, Troy; Ralph Mohr, Detroit; Stephen Hudgens, Southfield; Annette Johncock, Walled Lake, and Prem Nath, Rochester, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Nov. 5, 1984, Ser. No. 668,435
Int. Cl.[4] H01L 31/04; B05D 5/12
U.S. Cl. 427—74 20 Claims



1. A method for the roll-to-roll production of an electronic device by depositing a plurality of substantially superposed layers of semiconductor alloy material onto substrate material which is adapted to pass through at least one vacuum deposition chamber maintained at sub-atmospheric pressure, the method including the steps of:

passing the substrate material through the at least one deposition chamber for the deposition thereonto of at least a first doped semiconductor alloy layer of a first conductivity type and a second semiconductor alloy layer of a conductivity type differing from the conductivity type of the first deposited layer; and

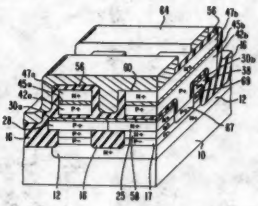
breaking vacuum and exposing the substrate material to ambient atmosphere after the deposition of at least one of the layers of semiconductor alloy material, whereby the deposition of all the semiconductor alloy layers for the production of a given electronic device does not occur in a single vacuum envelope.

4,624,863

METHOD OF FABRICATING SCHOTTKY DIODES AND ELECTRICAL INTERCONNECTIONS IN SEMICONDUCTOR STRUCTURES

Madhukar B. Vora, Los Gatos, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Division of Ser. No. 380,184, May 20, 1982, Pat. No. 4,543,595.
This application Jan. 31, 1985, Ser. No. 696,969
Int. Cl.[4] H01L 29/48
U.S. Cl. 427—84 17 Claims



1. A method of fabricating Schottky diodes and electrical connections between opposite conductivity type regions in an underlying semiconductor structure comprising:

depositing a first layer of semiconductor material across the surface of the underlying semiconductor structure;

doping the first layer of semiconductor material to correspond to the desired conductivity of the opposite conducting type regions in the underlying semiconductor structure between which electrical connections are desired;

depositing a first electrically conductive layer on the first layer of semiconductor material to short any PN junctions therein;

forming insulating material over the first electrically conductive layer;

depositing a second layer of semiconductor material over the insulating material and on the underlying semiconductor structure;

depositing a second electrically conductive layer on the second layer of semiconductor material;

depositing a third layer of semiconductor material on the second electrically conductive layer; and

depositing metal in contact with selected portions of third layer of semiconductor material to thereby form Schottky diodes.

4,624,864

PROCESS FOR THE AUTOPOSITIONING OF AN INTERCONNECTION LINE ON AN ELECTRIC CONTACT HOLE OF AN INTEGRATED CIRCUIT

Joël Hartmann, Claix, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 13, 1985, Ser. No. 744,395
Claims priority, application France, Jun. 14, 1984, 84 09313
Int. Cl.[4] H01L 21/283, 21/90
U.S. Cl. 427—89 8 Claims

1. A process for autopositioning an interconnecting line on an electric contact hole of an integrated circuit, consistng of the successive steps of:

(a) forming an insulating layer on a whole substrate having a semiconductor active zone;

(b) forming an opening in said insulating layer in front of said active zone, in order to obtain said electric contact hole;

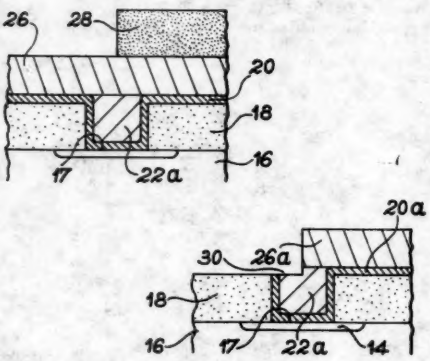
(c) depositing a first conductive coating on said insulating layer and on said active zone;

(d) depositing on said first conductive coating a filling material used for filling the contact hole, the surface of said material being substantially planar;

(e) carrying out an anisotropic etching of said filling material, so as to expose those parts of said first conductive

coating located outside said contact hole, and while retaining only that filling material portion which fills the contact hole;

(f) depositing on the structure obtained a second conductive coating, in which said interconnecting line will be formed;



(g) forming on said second conductive coating a resin mask used for defining the dimensions of said interconnecting line;

(h) eliminating those parts of said second and first conductive coating which are free from the mask, in order to form said inteconnecting line;

(i) eliminating said mask.

4,624,865

ELECTRICALLY CONDUCTIVE MICROBALLOONS AND COMPOSITIONS INCORPORATING SAME

Wayne L. Gindrup, Hickory, and Rebecca R. Vinson, Conover, both of N.C., assignors to Carolina Solvents, Inc., Hickory, N.C.

Filed May 21, 1984, Ser. No. 612,622
Int. Cl.[4] C23C *16/00, 16/44*
U.S. Cl. 427—126.2 **10 Claims**

1. A method of producing bright, mirror-like silver coated magnetic ceramic microballons comprising

providing a quantity of microballons formed of a ceramic material comprising a magnetic material selected from the group consisting of iron, nickel, iron oxide, ferrite, and mixtures of these materials imparting magnetic properties of the microballon,

dispersing the microballons in a plating solution consisting essentially of (a) a silver salt; (b) a reducing sugar and (c) an organic chelating agent and

chemically reducing the silver salt to form a bright, mirror-like silver coating on the surface of the ceramic magnetic microballons.

4,624,866

BRAZING SLEEVE HAVING CERAMIC FLUX BAND AND METHOD FOR APPLYING SAME

Wenche W. Cheng, Monroeville; Donald R. Stoner, Murrysville, both of Pa., and Harold T. Keller, deceased, late of Pittsburgh, Pa. (by Patricia A. Keller, administratrix), assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 27, 1984, Ser. No. 686,941
Int. Cl.[4] B05D *7/22, 7/14*
U.S. Cl. 427—190 **8 Claims**

1. A process for forming a ceramic flux band on a desired region of a metal sleeve to be used in a brazing operation, comprising:

cleaning the outer surface of said sleeve at least in said desired region thereof on which said ceramic flux band is to be formed;

forming a ceramic flux band on said desired region by melting a powder flux material in place thereon; and

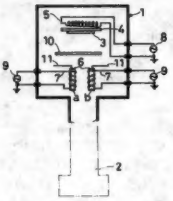
removing any oxide from the surface of said sleeve at least in the portion thereof, adjacent said band formation region, on which a brazed joint is to be formed.

4,624,867

PROCESS FOR FORMING A SYNTHETIC RESIN FILM ON A SUBSTRATE AND APPARATUS THEREFOR

Masayuki Iijima, Yatabemachi, and Yoshikazu Takahashi, Ohmachi, both of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 21, 1985, Ser. No. 714,291
Claims priority, application Japan, Mar. 21, 1984, 59-52344; Aug. 30, 1984, 59-179293; Sep. 25, 1984, 59-200257
Int. Cl.[4] C23C *16/00*
U.S. Cl. 427—255.6 **18 Claims**



1. A process for forming a synthetic resin film on a substrate and which comprises:

(a) evaporating at least two different monomers to cause said monomers to adhere to a surface of said substrate, and

(b) polymerizing said at least two different monomers on said surface of said substrate by maintaining said substrate at a temperature which causes said monomers to react with each other, thereby heat polymerizing to form said synthetic resin film;

wherein said process is carried out under vacuum.

4,624,868

BORATED POLYSACCHARIDE ABSORBENTS AND ABSORBENT PRODUCTS

Ernest G. Muller, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 421,658, Sep. 22, 1982, abandoned, which is a continuation of Ser. No. 275,479, Jun. 19, 1981, abandoned, which is a division of Ser. No. 104,204, Dec. 17, 1979, Pat. No. 4,333,461. This application Sep. 25, 1985, Ser. No. 781,187
Int. Cl.[4] A61F *13/16, 13/18, 13/20;* B05D *3/02*
U.S. Cl. 427—384 **9 Claims**

5. The process for obtaining a porous, freeze-dried absorbent material which comprises the steps of:

dispersing a cis-1,2-diol polysaccharide material in an aqueous medium to obtain a viscous solution of hydrated polysaccharide;

mixing the viscous solution under high shear conditions until the solution is uniformly homogenized;

then adding borax or other borate ion releasing compound to the homogenized solution of hydrated polysaccharide while stirring the solution to cross-link the hydrated polysaccharide and form a thickened gelled mass;

placing the thickened gelled mass on a substrate; and

freeze-drying said thickened gelled mass to obtain a porous freeze-dried absorbent cross-linked polysaccharide material.

4,624,869

ALKYD RESIN CURE MODIFIERS

Henry J. De Graaf, Stow, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,698
Int. Cl.[4] C08L 67/08
U.S. Cl. 427—385.5 4 Claims

1. An air-drying coating composition comprising a drying oil alkyd having blended therewith 5 to 50 weight percent of a polyester urethane cure modifier; said urethane modifier comprising the reaction product of one or more polyols with an alpha,beta-unsaturated dicarboxylic acid further reacted with a diisocyanate to produce said modifier having a number average molecular weight from about 400 to 1600 and containing from about 1 to 5 ethylenically unsaturated oxidative cure sites and at least one urethane linkage per molecule.

4. A process for coating off-road vehicles by applying the coating of claim 1 and curing said coated vehicle.

4,624,870

SODIUM FREE SILICONE RESIN COATING COMPOSITIONS

Blair T. Anthony, Bergen op Zoom, Netherlands, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 671,255, Nov. 14, 1984, abandoned. This application Oct. 11, 1985, Ser. No. 786,778
Int. Cl.[4] B05D 3/02; C08G 77/04
U.S. Cl. 427—387 12 Claims

10. A method for coating plastic substrates with a silica-containing coating which comprises:

(1) applying to the substrate a curable silicone resin coating composition having a pH between about 7.1 and 7.8 comprising ammonium hydroxide-stabilized colloidal silica and a partial condensate of an organotrialkoxy silane;

(2) maintaining the pH of said composition by use of a base which is volatile at the temperature and selected for cure of the composition; and

(3) curing the curable composition at a temperature sufficient to volatilize said base.

4,624,871

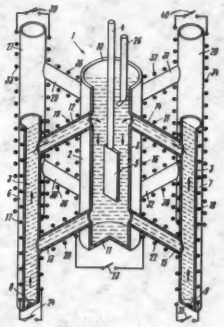
METHOD OF PRODUCING MULTICOMPONENT DIFFUSION COATINGS ON METAL ARTICLES AND APPARATUS FOR PERFORMING SAME

Georgy G. Maximovich; Yaroslav V. Ganysh; Viktor F. Shatinsky; Evgeny M. Ljuty, and Ivan J. Tretyak, all of Lvov, U.S.S.R., assignors to Fiziko-Mekhanichesky Institut Imeni Karpenko Akademii Nauk Ukrainskoi SSR, Lvov, U.S.S.R.

Filed Oct. 17, 1985, Ser. No. 788,467
Int. Cl.[4] C23C 8/58
U.S. Cl. 427—431 5 Claims

1. A method of producing multicomponent diffusion coatings on metal articles, in a melt including the steps of:

separately dissolving alloying elements in a transport melt at temperature T equalling 0.5 to 0.8 of their respective melting points by selectively heating each element in a peripheral chamber connected by a duct to a central chamber containing said metal article; and maintaining the surface of said metal article at a temperature of T, equalling 0.3 to 0.5 of the melting of said article with the difference T-Ti being at least 50° C. thereby causing the alloying elements to diffuse into the surface of said metal article.



4,624,872

LIQUID CRYSTALLINE POLYMER SUBSTRATES WITH ORTHOGONAL MOLECULAR ORIENTATION

Dagobert E. Stuetz, Watchung, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 13, 1984, Ser. No. 640,477
Int. Cl.[4] C09K 19/38; H01S 3/10
U.S. Cl. 428—1 11 Claims

3. A polymeric nonlinear optical medium comprising a film of thermotropic liquid crystal polymer having an external field-induced stable uniaxial orthogonal molecular orientation within about 10 degrees of perpendicular to the film plane, wherein the polymer has a wholly aromatic chemical structure characterized by the recurring unit:

—Ar—X—Ar—

where X is a divalent radical selected from estero, amido, azomethino, azo, azoxy, etheno and ethyno groups, and Ar is a divalent aromatic radical selected from phenylene, naphthylene and diphenylene groups, and aromatic radicals corresponding to the formula:

where Y is a carbonyl, sulfono, oxy or thio group.

4,624,873

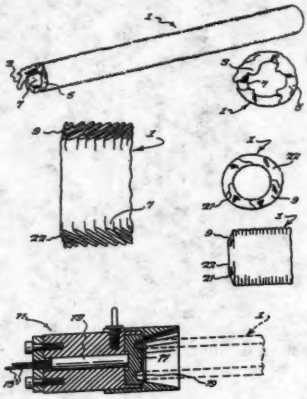
END-DRESSING FOR TUBULAR CASINGS

Hugo De Jong, Lommel, and Hugo Thijs, Hechtel, both of Belgium, assignors to Teepak, Inc., Oak Brook, Ill.

Continuation of Ser. No. 559,165, Dec. 7, 1983. This application Nov. 21, 1985, Ser. No. 800,476
Int. Cl.[4] A22C 13/02
U.S. Cl. 428—36 3 Claims

1. In a shirred strand of tubular food casing film wherein said strand has on at least one terminal end thereof loose, unshirred or residual casing film, the improvement which comprises the strand having an end-dressing at an affected terminal end, said dressing being formed from said loose, unshirred or residual casing film by compressing said loose, unshirred or residual casing film against the terminal edge of the shirred strand while heating to a temperature below the fusion temperature of said

film, said loose, unshirred or residual casing material being secured to the terminal edge by ironing-onto said edge without



adhesion, whereby the ironed-on loose, unshirred or residual casing material releases from said edge during filling.

4,624,874

REMOVABLE CORE FOR THE PRODUCTION OF TUBULAR STRUCTURES FROM FIBRE REINFORCED MATERIALS

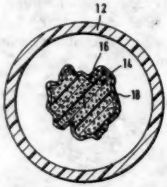
Rainer Schütze, Brunswick, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e. V., Cologne, Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 759,065

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428282

Int. Cl.[4] B32B *1/08, 3/26, 33/00*

U.S. Cl. 428—36 **2 Claims**



1. A removable core for use in the production of a tubular structure from a fibre reinforced resin material, said core comprising a body composed of a foam material which softens or collapses under the action of heat sufficient to cure the resin material but is hard and cross-sectionally dimensionally stable under less heat than that, and a plastic tube of heat-shrinkabie material surrounding said body of foam material and heat-shrunk thereonto under heat less than that required for curing the resin material so as to closely embrace said body without deforming the same and to constitute therefor a coating which imparts to the core enhanced rigidity, dimensional stability, and a smooth outer surface, said tube being adapted to undergo further shrinkage during the application of heat to a tubular structure build up on said core sufficient to cure the resin material of said tubular structure, thereby to exert on the concomitantly softened foam material of said body compressive forces sufficient to decrease the cross-sectional dimensions of said body and enable removal of the core from said tubular structure.

2. A removable core according to claim 1 wherein said body of foam material is hollow.

4,624,875

PROTECTED CARD

Mitsuo Watanabe, Tokyo, and Takao Asaba, Kanagawa, both of Japan, assignors to Kojima, Ltd., Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,009

Int. Cl.[4] E04F *15/16;* **B32B** *3/02, 7/06, 31/00*

U.S. Cl. 428—41 **1 Claim**

1. A card assembly comprising a backing sheet, a first transparent film having an inner surface bonded to the backing sheet along one side margin area portion through a first pressure sensitive adhesive coating, a transparent releasable film adhesively bonded by a second pressure sensitive adhesive to an inner surface of the first transparent film along the remaining area portion, a cut line of a generally closed-loop configuration formed through the first transparent film and the releasable film to define a configuration corresponding to the circumference of a thin article to be interposed between the releasable sheet and the backing sheet, said configuration defining a margin area portion on the releasable sheet being along the entire circumference of the releasable sheet such that marginal areas thereof are removably attached to the first transparent film to expose the second pressure sensitive adhesive coating on said first transparent film and a second transparent film secured to the outer surface of the first transparent film along the entire surface thereof by means of an adhesive coating.

4,624,876

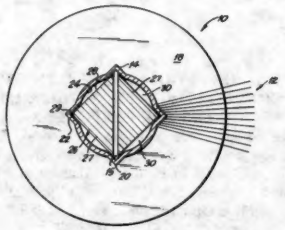
HUB FOR A ROTATABLE TOOL

Donald M. Nevin, 3 Clearmeadow Ct., Woodbury, N.Y. 11797

Filed May 13, 1985, Ser. No. 732,997

Int. Cl.[4] E04F *21/16*

U.S. Cl. 428—65 **5 Claims**



1. In a central hub for a rotatable tool, an improved central opening which allows the hub to be easily (a) mounted on a polygonal seat at one end of a rotatable mandrel for rotation of the tool with the mandrel and (b) subsequently removed with the tool from the seat of the mandrel; the improved opening extending through the hub along the axis of rotation of the tool and having, in cross-section taken perpendicularly to the axis of rotation, a complex shape comprising:

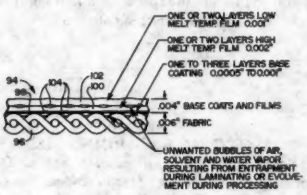
a plurality of corners and a plurality of concave arcuate lines connecting the corners; each corner being formed by substantially only a pair of intersecting generally straight lines and each arcuate line connecting the generally straight lines of a pair of adjacent corners; the corners, when connected by extending their straight lines, defining a polygon having substantially the same shape as, and a slightly larger size than, the polygonal cross-section of the seat of the mandrel; every straight line of each corner being connected to another straight line by an arcuate line.

4,624,877

INFLATABLE MATTRESS AND METHOD OF MAKING THE SAME

James M. Lea, and Peter D. Haggerty, both of Seattle, Wash., assignors to Cascade Designs, Inc., Seattle, Wash.

Filed Nov. 4, 1983, Ser. No. 549,238
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—71 26 Claims


ONE OR TWO LAYERS LOW MELT TEMP FILM 0.001"
ONE OR TWO LAYERS HIGH MELT TEMP FILM 0.002"
ONE TO THREE LAYERS BASE COATING 0.0005" TO 0.001"
.004" BASE COATS AND FILMS
.006" FABRIC
UNWANTED BUBBLES OF AIR, SOLVENT AND WATER VAPOR RESULTING FROM ENTRAPMENT DURING LAMINATING OR EVOLVEMENT DURING PROCESSING
94
96
104
102
100
98

1. In a method of making a foam filled, inflatable member, such as an air mattress, said method comprising:

a. providing a laminated sheet material by:

1. providing a first substantially nonstretching sheet layer;
2. providing a first solid polymer film layer which is structurally stable at a predetermined first higher temperature level;
3. heat laminating said first film layer to said sheet layer;
4. providing a second solid polymer film layer having a melting temperature which is at a predetermined second lower temperature level;
5. heating laminating the second film layer to the first film layer, thus making said laminated sheet material, which comprises said first sheet layer, said first film layer and said second film layer;

b. providing from said sheet material upper and lower sheet sections, and making a prebonded assembly where an intermediate open cell foam core is positioned between the sheet sections;

c. heating said sheet sections to soften the second film layers of the sheet sections and causing said foam core to come into proper prebonding engagement with the second film layers of the sheet sections;

d. cooling the sheet sections to cause the foam core to become bonded to the two sheet sections;

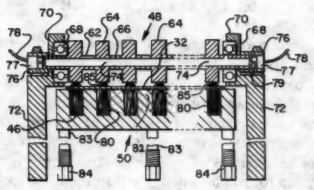
e. said method being characterized in that the first higher temperature level is sufficiently higher than said second temperature level that a difference between the two temperatures is sufficiently great so that air impervious integrity of the sheet sections is maintained.

4,624,878

WEATHERSTRIPPING PRODUCED BY TUFTING WITH FLATTENED KNUCKLES

Robert D. Evans, 44 Tubbs Springs Dr., Weston, Conn. 06883, and Robert C. Blezard, 29 Homestead St., North Smithfield, R.I. 02895

Filed Aug. 14, 1984, Ser. No. 640,665
Int. Cl.[4] D04H *11/00*
U.S. Cl. 428—95 20 Claims



20. Weatherstripping, comprising:

a row of tufts tufted into a strip of primary backing fabric and forming a row of pile fiber extending from one side of said strip and a row of tuft knuckles on the other side of said strip; and

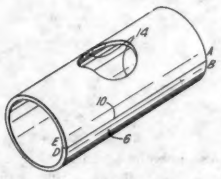
said tuft knuckles being deformed and flattened into a ribbon adhering to said primary backing fabric.

4,624,879

RECOVERABLE ARTICLE

Francis Van Dijck, Kessel-Lo; Johan Peeters, Rillaar, and Jozef Vanbeersel, Temse, all of Belgium, assignors to N.V. Raychem S.A., Kessel-lo, Belgium

Filed Nov. 2, 1984, Ser. No. 667,940
Claims priority, application United Kingdom, Nov. 8, 1983, 8329753
Int. Cl.[4] B32B *3/06*
U.S. Cl. 428—102 8 Claims



1. A recoverable article for covering an object of any predetermined shape comprising a recoverable cover joined to at least one other cover along a non-linear join-line, by a mechanical joining arrangement that penetrates the cover, such that at least one of the covers has a component of recovery substantially parallel to the join-line and such that at effective complete recovery of the article, the difference between the percentage recovery of each cover on either side of the join-line, measured parallel to the join-line, is not more than 20%.

4,624,880

SHAPED ARTICLE OF COMPOSITION COMPRISING THERMOPLASTIC SYNTHETIC RESIN AND CELLULAR MATERIAL AND METHOD OF PRODUCING SAME

Leslie B. Goulding, Old Orchard, and Ian F. Johnson, Woking, both of England, assignors to James Walker & Co., Limited, Woking, United Kingdom

Filed Mar. 18, 1985, Ser. No. 713,574

Claims priority, application United Kingdom, Mar. 21, 1984, 8407311

Int. Cl.[4] C08K *11/00;* B32B *5/16*

U.S. Cl. 428—143 15 Claims

1. A shaped article extruded from a heat softened composition comprising resiliently compressible cellular material in the form of particles or granules having a particle size in the range of about 0.3 mm to 2 mm and a polymeric matrix, said cellular material being present in an amount of at least 5 parts per 100 parts of polymeric matrix, by weight, said article comprising particles or granules of said cellular material in substantially undegraded form substantially uniformly dispersed throughout a substantially continuous phase comprising said polymeric matrix and having a textured surface resulting from at least partial relief of the compression of said cellular material caused by the extrusion process, and said polymeric matrix comprising a thermoplastic synthetic resin which is at least substantially saturated, said matrix having a stiffness modulus of not more than 1000 MPa and being extrudable in the heat-softened state under conditions, at which the cellular material is not significantly degraded, and the extruded composition having a Poissons ratio which is less than the Poissons ratio of the matrix.

4,624,881

MULTIPLE-USE PRESSURE-SENSITIVE TRANSFER RECORDING MEDIA

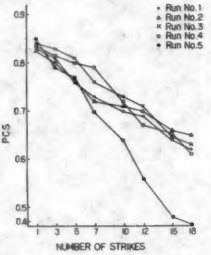
Masami Shini, Itami, Japan, assignor to Fuji Kagakushi Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 9, 1985, Ser. No. 753,173

Claims priority, application Japan, Jul. 13, 1984, 59-146524; Sep. 18, 1984, 59-195374

Int. Cl.[4] B32B *3/26, 5/18;* B41J *31/02*

U.S. Cl. 428—207 12 Claims



1. Multiple-use pressure-sensitive transfer recording media which comprise a foundation and a finely porous resinous layer provided on the foundation, said porous layer comprising minute porous filler particles and a resinous binder material for bonding the porous particles to each other and containing a liquid ink paste substantially incompatible with the resinous binder material, said liquid ink paste containing from 20% to 40% by weight of coloring pigment, from 1% to 30% by weight of a liquid fatty acid and from 1% to 10% by weight of an oil-soluble dye dissolved in said liquid fatty acid, said liquid ink paste having a viscosity of not less than 300 cp and less than 4000 cp at ordinary room temperatures.

4,624,882

MICROSCOPE SLIDE WITH RAISED MARKING SURFACE

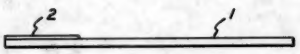
John M. Melisz, Portsmouth, and Frank H. Jellinek, Rye, both of N.H., assignors to Sybron Corporation, Saddle Brook, N.J.

Continuation of Ser. No. 441,448, Nov. 15, 1982. This application Aug. 29, 1984, Ser. No. 645,192

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.[4] G02B *21/34*

U.S. Cl. 428—210 6 Claims



1. A microscope slide so configured with a raised portion at one end thereof that a plurality of such slides are stackable without extended area contact between them for substantially scratch-free packaging, said slide comprising:

a flat glass plate on which said raised portion is a marking surface for holding and retaining a marking formed of a coating of a resinous material on said glass plate,

said resinous material including a granular medium to impart porosity to said coating and a pigment to provide visual contrast to said coating to enhance visibility of the marking to be placed thereon,

said raised marking surface being effective to provide a barrier to prevent the spread of liquid sample, placed upon said slide, onto said marking surface.

4,624,883

MAGNETIC RECORDING MEDIUM

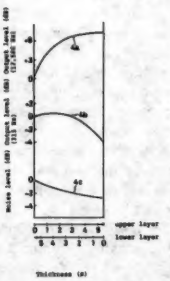
Satoru Yamaguchi, Kyoto; Kozaburoh Satoh, Kameoka; Jozo Shimizu, Nagaokakyo, and Haruo Andoh, Suita, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Mar. 19, 1984, Ser. No. 590,796

Claims priority, application Japan, Mar. 20, 1983, 58-46365

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—212 5 Claims



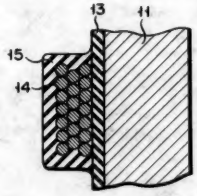
1. A magnetic recording medium for audio recording which comprises a base, a lower magnetic layer containing magnetic particles having an average particle length (long axis diameter) of from 0.4 to 0.7μ provided on said base, and an upper magnetic layer containing magnetic particles having an average particle length (long axis diameter) of not more than 0.35μ provided over said lower magnetic layer, the coercive force of said upper magnetic layer being from 660 to 760 oersteds, the ratio of the coercive force of the upper layer to that of the lower layer being 1.2/1 to 1.5/1.

4,624,884

HEAT RADIATING INSULATION FOR COIL

Hitoshi Harada, and Yasumi Ohsera, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 392,368, Jun. 25, 1982, abandoned. This application Sep. 11, 1985, Ser. No. 775,108
Claims priority, application Japan, Jul. 1, 1981, 56-102430
Int. Cl.[4] B32B *5/16*; B44D *1/094, 1/44*
U.S. Cl. 428—218 6 Claims



1. A heat radiating insulator which is in the form of powder and used in a coil by impregnation or by coating, comprising a thermosetting synthetic resin compound; and

a filler added to the thermosetting synthetic compound, consisting mainly of magnesium oxide, and a thermal conductivity of 1.0×10^{-2} cal/cm.deg.sec and a bulk density of 1.0 to 3.5 g/cc,

said filler being mixed with said thermosetting synthetic resin compound when said thermosetting synthetic resin compound has been melted at a temperature of 70° to 130° C.

4,624,885

LOW DENSITY MATRIX RESINS FOR FILAMENT WOUND CHAMBERS COMPRISING CHAIN EXTENDED CARBOXY-TERMINATED POLYBUTADIENES

Neal A. Mumford, and Ben A. Lloyd, both of Brigham City, Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Nov. 28, 1984, Ser. No. 675,901
Int. Cl.[4] D03D *13/00*
U.S. Cl. 428—222 20 Claims

1. A cured, filament wound composite comprising fibers in a matrix resin, said resin comprising whe uncured an aromatic vinyl hydrocarbon monomer and a chain-extended carboxy-terminated poly (1,2-butadiene) made by reacting a carboxy-terminated poly(1,2-butadiene) with a difunctional compound capable of reacting with carboxyl groups in an equivalents ratio of difunctional compound/carboxyl of 0.5/1.

4,624,886

REINFORCED FIBRE PRODUCTS

Frederic N. Cogswell, Guisborough, and Umakant Measuria, Great Ayton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jan. 15, 1985, Ser. No. 691,642
Claims priority, application United Kingdom, Jan. 27, 1984, 8402193
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—245 4 Claims

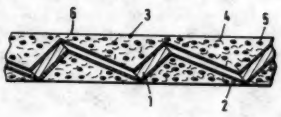
1. A fibre reinforced, thermoformable, plastics composite containing at least 30% by volume of reinforcing fibres comprising reinforcement in the form of a fabric woven from reinforcing fibres characterised in that the short beam shear strength of the composite as determined by ASTM Standard D-2344 using a sample span:thickness ratio of 5:1, is at least 0.7 times the tensile strength or yield strength of the plastics material forming the matrix of the composite.

4,624,887

MATERIAL FOR SLIDING SURFACE BEARINGS

Wolfgang Bickle, Reilingen; Rolf Pfoh, Rauenberg, and Karl Becker, St. Leon-Rot, all of Fed. Rep. of Germany, assignors to Kolbenschmidt AG, Neckarsulm, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 827,132
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505373
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—256 6 Claims



1. A sheet material for sliding surface bearings comprising an expanded metal mesh composed of a wrought aluminum alloy having an elongation at break $\delta_5=8$ to 20% and a Brinell Hardness Number HB of 35 to 65; a primer layer coating the surface of the expanded metal mesh and having a thickness of 2 to 10 micrometers; and on the primer layer and composed of 10 to 30 wt. % of a filler for improving the thermal conductivity and wear resistance, 10 to 30 wt. % glass fibers and 40 to 80 wt. % polytetrafluoroethylene (PTFE).

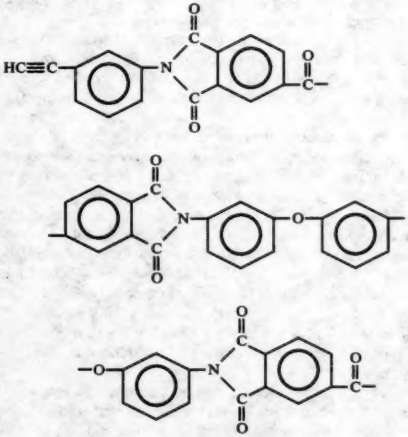
4,624,888

ACETYLENE (ETHYNYL) TERMINATED POLYIMIDE SILOXANE AND PROCESS FOR PREPARATION THEREOF

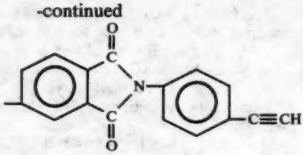
Terry L. St. Clair, Poquoson, Va., and Shubha Maudgal, New Delhi, India, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1985, Ser. No. 781,813
Int. Cl.[4] B32B *7/00, 9/04*
U.S. Cl. 428—262 5 Claims

1. A composition of matter consisting of a blend containing (a) 90–10% of an acetylene terminated oligomer having the formula:



-continued



and (b) 10–90% of the oligomer produced by:

combining an aminiophenylacetylene and an aromatic dianhydride in molar ratio quantities selected from the molar ratio group consisting of 1:1, 2:3, and 1:2 molar ratios in a solvent;

permitting the combined solution to react for approximately one hour;

adding a quantity of a diaminosiloxane to the reacted solution equal to a 0.5, 2, and 1.5 multiple of the respective molar ratio quantity selected for the aminophenylacetylene and aromatic dianhydride; and

permitting the resulting solution to react for approximately one and one-half hours at room temperature.

3. A prepreg prepared by applying the oligomer blend of claim 1 onto a graphite cloth, air drying the coated graphite cloth for approximately one-half hour at approximately 100° C., and imidizing for approximately one hour at approximately 130° C. to yield a prepreg having improved physical properties of drape, tack, and adaptability for cutting and forming into shaped layers.

4,624,889

LAUNDERABLE TEXTILE SIZING HAVING STAIN RESISTANCE AND SOIL RELEASE

James L. Bries, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 17, 1984, Ser. No. 642,133

Int. Cl.[4] D06M *15/09, 15/11, 15/256*

U.S. Cl. 428—264 **13 Claims**

1. A fabric treating composition for frequently laundered fabrics capable of rendering the surface of fabric treated therewith oleophobic and hydrophobic under atmospheric conditions, said composition comprising

(a) water-soluble fabric sizing agent;

(b) reversibly autoadaptable segmented hybrid copolymer having a maximum glass temperature below about 130° C. comprising a balance of the following:

(i) one or more hydrophilic segments containing an average of more than two water-solvatable polar groups and substantially free from fluorinated aliphatic pendent groups of at least 3 carbon atoms terminated by trifluoromethyl groups, and

(ii) one or more fluorinated segments substantially free from water-solvatable polar groups and containing an average of at least two fluoroaliphatic pendent groups terminated by trifluoromethyl groups, which contain at least 3 and not more than 20 fully fluorinated carbon atoms and provide in the copolymer at least 1% bound fluorine, the intraconnecting structure of said fluorinated segments being substantially free of fluorine and the fluorinated segments being nonglassy and amorphous at a temperature not higher than 130° C.,

said copolymer being internally oleophobic and substantially water insoluble after application to said fabric; and

(c) water

wherein the weight ratio of hybrid copolymer to sizing agent is greater than about 1 part hybrid copolymer to 50 parts sizing agent and the concentration of sizing agent in said composition is at least about 0.05% by weight.

4,624,890

ARTICLE SUITABLE FOR WIPING SURFACES

John Lloyd, and George K. Rennie, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

PCT No. PCT/GB85/00056, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985, PCT Pub. No. WO85/03722, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 13, 1985, Ser. No. 793,068

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—290 **21 Claims**

1. An article suitable for wiping surfaces, said article comprising a flexible absorbent substrate of fibrous material treated with a cationic polymeric dirt-capture agent and carrying a liquid cleaning composition, characterised in that the substrate comprises a sheet material having a base weight of at least 50 g/m^2 and a thickness of at least 0.5 mm and in that the cationic polymeric dirt-capture agent is a water-soluble cationic polyacrylamide.

4,624,891

HEAT-SENSITIVE TRANSFER MATERIAL

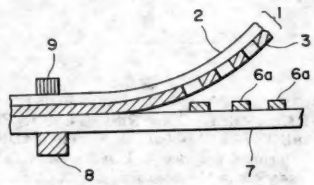
Hiroshi Sato, Hiratsuka; Naoki Kushida, and Kazumi Tanaka, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,277

Claims priority, application Japan, Mar. 9, 1984, 59-44878

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—321.3 **12 Claims**



1. A heat-sensitive transfer material, comprising: a support and a heat transfer layer formed on the support, said heat transfer layer comprising a micro-porous network resin structure of a thermoplastic resin and a heat-fusible gel ink contained in the micropores of said resin structure, said heat-fusible gel ink comprising a colorant, an oil incompatible with the thermoplastic resin and a gelation agent for the oil.

4,624,892

MAGNETIC RECORDING MEDIUM

Hideki Ishizaki; Hiroyuki Arioka, and Toshiaki Ide, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,173

Claims priority, application Japan, Jun. 29, 1984, 59-133240

Int. Cl.[4] G11B *5/70, 5/72;* **B32B** *5/16*

U.S. Cl. 428—323 **15 Claims**

1. In a magnetic recording medium comprising

a non-magnetic substrate having opposed major surfaces,

a magnetic recording layer formed on one major surface of the substrate, and

a topcoat layer formed on the magnetic layer,

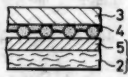
the improvement wherein the topcoat layer contains a submicron particulate pigment observable under an electron microscope to have a linear distribution density of 10 to 1,000 per linear 100 μm and a particle size of less than 200 Å whereby the topcoat layer has a surface roughness R20 of not more than 400 Å.

4,624,893

PRESSURE-SENSITIVE ADHESIVE TAPES OR SHEETS

Tomishi Shibano, Tama; Itsuo Kimura, Tokyo; Hiroaki Nomoto, Tokyo, and Sachio Maruchi, Tokyo, all of Japan, assignors to Sanyo Kokusaku-Pulp Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,173
Int. Cl.[4] B32B 5/16; C09J 7/02
U.S. Cl. 428—327 8 Claims



1. A pressure-sensitive adhesive tape or sheet including a paper substrate, a release layer provided on at least one side of said substrate and comprising modified starch or starch and a water-soluble organic fluorine compound selected from the group consisting of water-soluble salts of perfluoroalkyl phosphates, perfluoroalkyl sulfonamide phosphates, perfluoroalkoxyalkyl carbamates, perfluoroalkyl monocarboxylic acid derivatives, perfluoroalkylamines, and polymers having as a skeleton acrylic acid, methacrylic acid, vinyl alcohols, epoxy, fumaric acid, wherein each of said polymers contains a C_6–C_{12} fluorocarbon group on a repeating unit of the polymer, and an adhesive mass layer provided with respect to said release layer and containing a minute and spherical elastomeric polymer, said PSA tape or sheet having an adhesion of no more than 150 g/cm.

4,624,894

MAGNETIC RECORDING MEDIUM

Mikio Kishimoto, Osaka, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Apr. 4, 1985, Ser. No. 719,868
Claims priority, application Japan, Apr. 6, 1984, 59-69861
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—328 18 Claims

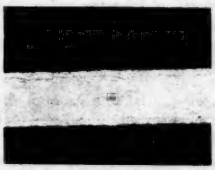
1. A magnetic recording medium, comprising:
a substrate;
a first magnetic layer formed on at least one side of the substrate, said first layer containing metallic magnetic particles;
a second magnetic layer formed on at least one side of said substrate on said first layer, said second layer containing plate-shaped ferrite magnetic particles having a hexagonal structure with the magnetization axis oriented in a direction substantially vertical to the surface of said second layer;
said plate-shaped ferrite magnetic particles having an average particle diameter of 0.03 to 0.2 micronmeters; and
the vertical coercive force ratio of the second layer to that of the first layer is 1.1 to 1.5.

4,624,895

ALUMINUM COATED LOW-ALLOY STEEL FOIL

Richard A. Nickola, Highland, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Jun. 4, 1984, Ser. No. 617,077
Int. Cl.[4] B32B 15/04
U.S. Cl. 428—335 11 Claims



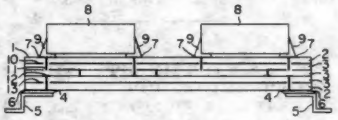
1. A cold rolled aluminum coated steel foil having a thickness (not substantially below) about 0.038 mm (0.0015 inches) and up to about 0.089 mm (0.0035 inches) formed from a hot-dip aluminum coated low-titanium alloy stabilized low-carbon steel sheet between about 0.25 mm (0.010 inches) and about 0.76 mm (0.030 inches) thick and having an aluminum coaitng on each surface of said foil which is between about 3.7 μm (0.00015 inches) and about 7.6 μm (0.0003 inches) thick with the aluminum in said coatings comprising between about 6 and 12 wt. percent aluminum based on the weight of said foil, said cold rolled aluminum coated steel foil having metallic iron-aluminum intermetallic compound formed during hot-dip coating of said sheet broken into small fragments and uniformly distributed throughout the cold rolled aluminum coating, and said aluminum coated steel foil characterized by being formable at room temperature without annealing and being resistant to oxidation at temperatures up to about 1149° C. (2100° F.).

4,624,896

MULTI-LAYER CERAMIC SUBSTRATE AND METHOD FOR THE PRODUCTION THEREOF

Yutaka Watanabe, Hadano; Fumiyuki Kobayashi, Sagamihara; Satoru Ogihara, Hitachi, and Yoshiyuki Ohzawa, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,889
Claims priority, application Japan, Jul. 4, 1983, 58-120359
Int. Cl.[4] B32B 3/10
U.S. Cl. 428—428 6 Claims



1. A multi-layer ceramic substrate comprising a plurality of conductor layers and insulating layers positioned between said conductor layers, said insulating layers including layers of a sintered body principally comprised of mullite, layers of a sintered body principally comprised of alumina and layers of a sintered body principally comprised of a mixture of mullite and alumina; wherein the insulating layer positioned on at least one surface of the substrate is made of a sintered body principally comprised of alumina, the insulating layer positioned between a signal line layer and a alternating ground layer where return current from the signal line flows is made of a sintered body principally comprised of mullite, and the insulating layers disposed between said layers of a sintered body principally comprised of mullite and said layers of a sintered body principally comprised of alumina are made of a sintered body principally comprised of a mixture of mullite and alumina.

4. A method of producing a multi-layer ceramic substrate, which comprises the steps of preparing first green sheets each being principally comprised of mullite and each having a conductor layer formed on its surface, second green sheets each being principally comprised of alumina and each having a conductor layer formed on its surface and third green sheets each being principally comprised of a mixture of mullite and alumina and each having a conductor layer formed on its surface, and laminating said first, second and third green sheets and sintering the laminate; during said laminating step, said green sheets being laminated so that at least one of said second green sheets will be positioned on at least one surface of a substrate and at least one of said third green sheets will be positioned between at least one of said first green sheets and at least one of said second green sheets.

4,624,897

CLAD BRAZING FILLER FOR BONDING CERAMIC TO METAL, GLASS, OR OTHER CERAMIC AND COMPOSITES USING SUCH FILLER

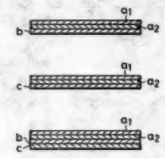
Masaya Ito, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jun. 8, 1984, Ser. No. 618,784

Claims priority, application Japan, Jun. 17, 1983, 58-107650

Int. Cl.[4] B32B *15/01, 15/04, 17/06, 18/00*

U.S. Cl. 428—432 **2 Claims**



1. A brazing filler for use in bonding a ceramic to one of a metal, glass or ceramic, said brazing filler comprising one of a low thermal expansion metal layer, a low Young's modulus metal layer and a combination low thermal expansion metal layer and a low Young's modulus metal layer, in combination with a filler consisting of one of an Ag layer, Cu layer, Ag-Cu alloy layer, and a combination of Ag and Cu layers, and an adjacent Ti layer, the Ti content being in the range of 3 to 80% of the total weight of said brazing filler, one of said low thermal expansion metal layer and said low Young's modulus metal layer being adjacent to and integral with any one of said Ag layer, Cu layer, Ag-Cu alloy layer and Ti layer.

4,624,898

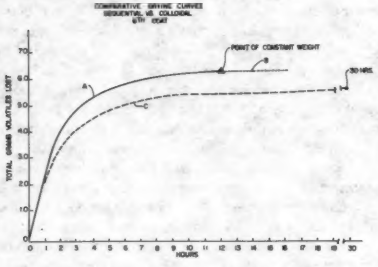
PROCESSES FOR THE APPLICATION OF REFRACTORY COMPOSITIONS TO SURFACES SUCH AS FOR THE PREPARATION OF REFRACTORY SHELL MOLDS AND REFRACTORY COMPOSITIONS PRODUCED THEREBY

John R. Moore, Florham Park, and Stephen Maybaum, Short Hills, both of N.J., assignors to Harborchem, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 638,412, Aug. 7, 1984, abandoned. This application Mar. 22, 1985, Ser. No. 715,010

Int. Cl.[4] B32B *9/04*

U.S. Cl. 428—446 **79 Claims**



1. A process for providing a refractory composition on a surface comprising coating said surface with a first coating comprising one of either an acidic hybrid binder composition or a basic colloidal silica sol composition; drying said first coating, coating said dried first coating with a second coating comprising the other of said acidic hybrid binder composition and said basic colloidal silica sol composition, drying said second coating, and coating said dried second coating with a plurality of additional coatings of acidic hybrid binder composition and basic colloidal silica sol composition so that each of said additional coatings of said basic colloidal silica sol composition contacts a coating of acidic hybrid binder composition to form alternating coatings of said acidic hybrid binder composition and said colloidal silica sol composition; and drying each of said plurality of additional coatings prior to coating with the alternating coating for a sufficient time so that application of a subsequent coating thereto does not substantially soften said coating.

4,624,899

NOVEL ORGANOPOLYSILOXANE COMPOSITIONS USEFUL AS MOLD RELEASE COATINGS

Louis Macaigne, Mezieres sur Seine, and Jean-Marie Pouchol, Lyons, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Dec. 20, 1985, Ser. No. 811,285

Claims priority, application France, Dec. 20, 1984, 84 19510

Int. Cl.[4] B32B *9/04;* **C08K** *5/54*

U.S. Cl. 428—447 **6 Claims**

1. An organopolysiloxane composition comprising:

(A) 100 parts of a diorganopolysiloxane oil of the average general formula:

$$G(CH_3)_2Si[OSi(CH_3)R]_x[OSi(CH_3)_2]_yOSi(CH_3)_2G$$

in which the symbols R, which are identical or different, are each an alkyl radical containing from 7 to 15 carbon atoms, or a phenylalkyl radical, the alkyl moiety of which contains from 1 to 6 carbon atoms; the symbol G is R or a hydroxy or methyl radical; the symbol x is any number $\geqq 6$; the symbol y is zero or any number which does not exceed $\frac{1}{3}$ of the value of x, with the sum $x+y$ being such that said oil has a viscosity of 50 to 5,000 mPa.s at 25° C.;

(B) 15 to 80 parts of an organopolysiloxane copolymer comprising recurring units of the formulae $(CH_3)_3SiO_{0.5}$ and SiO_2, distributed such that the molar ratio $(CH_3)_3SiO_{0.5}/SiO_2$ ranges from 0.4 to 1.2; and

(C) 200 to 2,000 parts of an inert organic diluent.

4. A mold form, the wall members thereof being provided with non-stick release coatings of the organopolysiloxane composition as defined by claim 1.

4,624,900

AQUEOUS POLYSILOXANE EMULSIONS FOR ANTI-ADHESIVE/WATER-REPELLENT COATINGS

Alain Fau, Tassin-La Demi-Lune, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jun. 12, 1985, Ser. No. 743,811

Claims priority, application France, Jun. 12, 1984, 84 09107

Int. Cl.[4] B32B *9/04*

U.S. Cl. 428—447 **13 Claims**

1. A storage-stable, aqueous emulsion composition of matter comprising an anti-adhesive/water-repellency effective amount of (A) a diorganopolysiloxane oil having the formula:

$$HO(SiR_2O)_nH$$

wherein the symbols R, which may be identical or different, are each an alkyl radical containing from 1 to 3 carbon atoms, the 3,3,3-tri-fluoropropyl radical, or the vinyl radical, at least 50% of the radicals R being methyl radicals and at most 5% vinyl radicals, and the symbol n is any number, the value of which is such that the viscosity of the oil ranges from 500 to 50,000 mPa.s at 25° C.; (B) an organopolysiloxane resin comprising a copolymer having recurring units selected from among those of the formulae SiO_2 $R'SiO_{1.5}$, R'_2SiO and $R'_3SiO_{0.5}$, in which the symbols R' which may be identical or different, are each an alkyl radical containing from 1 to 3 carbon atoms, or the vinyl radical, at least 70% of the radicals R' being methyl radicals, and said units being distributed such as to

provide a R'/Si ratio ranging from 1.05 to 1.85; (C) a liquid organohydropolysiloxane containing at least 3 hydrogen atoms per molecule directly bonded to silicon atoms, said organic groups bonded to the silicon atoms being R' radicals as defined above, at least 80% of said radicals being methyl radicals; (D) a thickening amount of a thickening agent; (E) a water-repellency effective amount of a vinyl acetate homoor copolymer; (F) a polyvinyl alcohol; (G) an emulsifying amount of a nonionic emulsifier; and (H) water.

4,624,901

INTERMEDIARY LAYERS FOR EPITAXIAL HEXAGONAL FERRITE FILMS

Howard L. Glass, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 4, 1985, Ser. No. 720,202

Int. Cl.[4] C04B *35/00;* **B32B** *9/00, 19/00*

U.S. Cl. 428—469 **14 Claims**

1. A composition, comprising:

a single crystal substrate of a nonmagnetic material lattice matched to a selected hexagonal ferrite;

a single crystal film of said selected hexagonal ferrite disposed on said substrate; and

a single crystal film of a second ferrite interposed between said substrate and said single crystal film of hexagonal ferrite, wherein said second ferrite is not a hexagonal ferrite.

13. A method for preparing single crystal films of a selected hexagonal ferrite, comprising:

providing a single crystal nonmagnetic substrate lattice matched to said selected hexagonal ferrite;

depositing a single crystal film of a second ferrite on said substrate surface; and

depositing a single crystal film of said selected hexagonal ferrite on said single crystal film of a second ferrite, wherein said second ferrite is not a hexagonal ferrite.

4,624,902

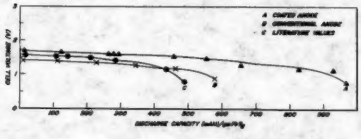
COATINGS FOR ELECTROCHEMICAL ELECTRODES AND METHODS OF MAKING THE SAME

John P. deNeufville, Mendham; Dalbir Rajoria, Summerville, both of N.J., and Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignors to Voltaix, Incorporated, North Branch, N.J.

Continuation of Ser. No. 507,752, Jun. 27, 1983. This application Aug. 26, 1985, Ser. No. 769,857

Int. Cl.[4] H01M *10/36, 4/36*

U.S. Cl. 429—218 **14 Claims**



1. A coated electrode which is capable of electrochemically releasing an active species to an electrolyte in an electrochemical cell, said electrode comprising:

an electrode body comprising active material for storing said active species and subsequently discharging at least a portion of such stored active species to provide a supply of electrons; and

a non-metallic, inorganic coating for reducing passivation of said electrode, said coating consisting essentially of lithium, silicon and fluorine.

4,624,903

DISPERSIONS OF WATER-INSOLUBLE PHOTOGRAPHIC ADDENDA WITH PETROLEUM SULFONATE

Michael J. Simons, Ruislip, United Kingdom, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1985, Ser. No. 800,199

Claims priority, application United Kingdom, Nov. 23, 1984, 8429678

Int. Cl.[4] G03C *1/04, 1/38, 1/40, 1/84*

U.S. Cl. 430—14 **7 Claims**

7. A processed photographic element comprising a support bearing at least one layer comprising a developed image and at least one layer comprising a dispersion of a water-insoluble photographic addendum in a hydrophilic colloid composition, said dispersion comprising an oil-soluble petroleum sulfonate which is liquid at 20° C.

4,624,904

PHOTOCONDUCTIVE IMAGING MEMBERS WITH UNSYMMETRICAL SQUARAINE COMPOUNDS CONTAINING AN HYDROXYL GROUP

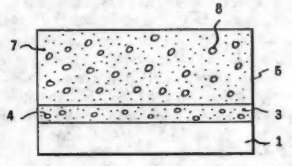
Peter M. Kazmaier; Richard A. Burt, and Giuseppa Baranyi, all of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 28, 1985, Ser. No. 749,857

The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—59 **49 Claims**



1. An improved photoresponsive imaging member comprised of (1) a supporting substrate, (2) a photoconductive layer comprised of the unsymmertical squaraine compounds selected from the group consisting of (4-dimethylaminophenyl) (4-dimethylamino-2-hydroxyphenyl) squaraine; (4-dimethylaminophenyl) (2,6-dihydroxy-4-dimethylaminophenyl) squaraine; (4-dimethylaminophenyl) (9-(8-hydroxyjulolidinyl) squaraine; (4-dimethylamino-2-methylphenyl) (4-dimethylamino-2-hydroxyphenyl) squaraine; (4-dimethylamino-2-methylphenyl) (2,6-dihydroxy-4-dimethylaminophenyl) squaraine; (4-dimethylamino-2-fluorophenyl) (4-methylamino-2-hydroxyphenyl) squaraine; (4-dimethylamino-2-fluorophenyl) (2,6-dihydroxy-4-dimethylaminophenyl) squaraine; and (2,6-dihydroxy-4-dimethylaminophenyl) (4-dimethylamino-2-hydroxyphenyl) squaraine; and (3) a hole transport layer comprised of aryl amine molecules dispersed in a resinous binder.

4,624,905
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

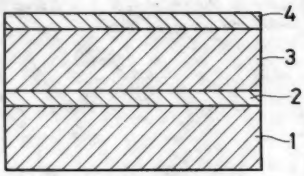
Hisao Haku; Kazuyuki Goto; Masayuki Tanaka, all of Hirakata; Takeo Fukatsu, Uzi, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 13, 1984, Ser. No. 640,314

Claims priority, application Japan, Feb. 14, 1984, 59-26254; Feb. 14, 1984, 59-26255

Int. Cl.[4] G03G *5/082, 5/14*

U.S. Cl. 430—65 **9 Claims**



1. An electrophotographic photosensitive member comprising:

(a) a substrate;

(b) a photoconductive layer superposed on the substrate, said layer comprising amorphous silicon having oxygen added thereto in an amount of from 2.5×10^{19} to 1.5×10^{22} atoms/cm^3 to increase its resistivity; and

(c) a surface layer superposed on the photoconductive layer, the surface layer having a thickness in the range of from about 0.1 to 5 um and comprising amorphous silicon having added thereto nitrogen to form an insulating material therein, the concentration of nitrogen varying differentially from a minimum on the substrate side of the surface layer to a maximum on the surface side thereof.

4,624,906
ELECTROPHOTOGRAPHIC SENSITIVE MEMBER HAVING A FLUORINATED AMORPHOUS SILICON PHOTOCONDUCTIVE LAYER

Takao Kawamura, 17-11, Takakura-dai 1-chome, Sakai-shi, Osaka; Yoshikazu Nakayama, and Koji Akiyama, both of Osaka, all of Japan, assignors to Kyocera Corporation and Takao Kawamura, both of Kyoto, Japan

Filed Sep. 24, 1984, Ser. No. 654,197

Claims priority, application Japan, May 18, 1984, 59-100751

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—84 **12 Claims**

1. An electrophotographic sensitive member, characterized by comprising a hydrogen and fluorine containing amorphous silicon photoconductive layer having an absorption coefficient ratio of the peaks of 827 cm^{-1} to 1015 cm^{-1} in an infrared absorption spectrum of 1.3 or more.

4,624,907
ELECTROPHOTOGRAPHIC TONER CONTAINING METAL COMPLEX

Isao Niimura, Iwatsuki; Katsuichi Motohashi, Urawa; Hiroyoshi Yamaga, Fukaya, and Noboru Akuzawa, Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,370

Int. Cl.[4] G03G *9/08, 9/10*

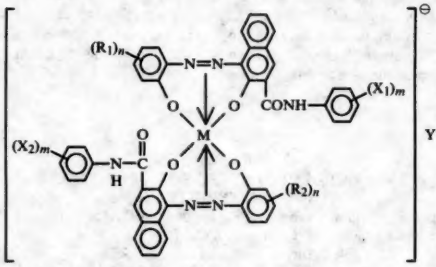
U.S. Cl. 430—106 **4 Claims**

1. An electrophotographic toner capable of being electrified nagatively comprising:

(a) a binder resin; and

(b) a charge-controlling and coloring agent comprising at least one 2:1 type metal complex of the formula (I):

(I)



where each of X_1 and X_2, which may be the same or different, is a hydrogen atom, a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a nitro group or a halogen atom, each of m and m' is an integer of 1 to 3, each of R_1 and R_2, which may be the same or different, is a hydrogen atom, a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a halogen atom, a nitro group, a sulfonamide group, a methylsulfonyl group, an ethylsulfonyl group, an acetyl amino group or a benzoyl amino group, each of n and n' is an integer of 1 to 3, $Y^{\oplus}$ is an ammonium ion, an aliphatic ammonium ion, an alicyclic ammonium ion or a heterocyclic ammonium ion, and M is an iron atom, provided that R_1 and R_2 are not simultaneously nitro groups.

4,624,908
DEEP ULTRA-VIOLET LITHOGRAPHIC RESIST COMPOSITION AND PROCESS OF USING

George Schwartzkopf, Franklin Township, Somerset County, N.J., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.

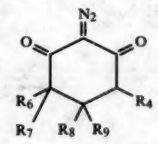
Filed Apr. 15, 1985, Ser. No. 723,273

Int. Cl.[4] G03C *1/54, 1/60*; G03F *7/26*

U.S. Cl. 430—192 **30 Claims**

1. A lithographic deep UV light sensitive positive photoresist composition for use with deep UV light of less than 300 nm comprising a base soluble film-forming positive photoresist polymer and in admixture therewith an effective amount of a deep UV photosensitive solubilizing agent compound of the formula:

(Formula I)



wherein:

R_4 is —C(O)R_5 in which R_5 is an alkoxy group having from 1 to about 20 carbon atoms;

R_6, R_7, R_8 and R_9 may each be the same or different and are selected from the group consisting of hydrogen and alkyl of from 1 to about 6 carbon atoms or

(a) one of either R_6 or R_7 and one of either R_8 and R_9 is hydrogen and the other of either R_6 or R_7 and the other of either R_8 or R_9 which is not hydrogen together form an alkylene group of from 1 to about 6 carbon atoms, or

(b) one set of either R_6 and R_7 together or R_8 and R_9 together is a cycloalkyl group of from 4 to 8 carbon atoms and the other set of either R_6 and R_7 or R_8 and R_9 that is not cycloalkyl are each hydrogen,

whereby upon exposure to deep UV radiation the exposed composition becomes more soluble in alkaline developer.

15. A castable resist composition comprising the lithographic resist composition of claim **1** in a film-forming solvent having a boiling point of from about 120° to 210° C.

23. A process for forming a lithographic resist image comprising image-wise exposing to deep UV light of less than about 300 nm a film cast on a substrate and dissolving the exposed portion of said film with a basic solution, wherein the film cast on the substrate comprises a film cast from the castable composition of claim **15**.

4,624,909

SILICON-CONTAINING NOVOLAK RESIN AND RESIST MATERIAL AND PATTERN FORMING METHOD USING SAME

Yasushi Saotome; Hiroshi Gokan; Kazuhide Saigo; Masayoshi Suzuki, and Yoshitake Ohnishi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,457

Claims priority, application Japan, Apr. 27, 1984, 59-85231; Sep. 27, 1984, 59-202323; Sep. 28, 1984, 59-203222; Oct. 1, 1984, 59-205928

Int. Cl.[4] **C08G** *77/00, 8/28, 77/60*

U.S. Cl. 430—192 **34 Claims**

1. A novolak resin comprising structural units having a trimethylsilyl group attached to benzene ring of a phenol via at least one methylene group.

4,624,910

IMAGE RECORDING PROCESS

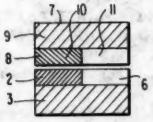
Keiji Takeda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 28, 1985, Ser. No. 738,002

Claims priority, application Japan, May 25, 1984, 59-106225

Int. Cl.[4] **G03C** *5/54, 5/16*

U.S. Cl. 430—203 **9 Claims**



1. An image recording process which comprises a step of (i) imagewise exposing a layer containing at least silver halide of an image recording material comprising (a) silver halide, (b) a reducing agent capable of developing silver halide, (c) a photopolymerization sensitizing dye capable of being reduced into a leuco substance by said reducing agent, (d) a polymerizable vinyl monomer and (e) a hydrogen donative compound, to light to form a latent image, a step of (ii) uniformly heating said recording material to form a photopolymerization sensitizing dye image in a part corresponding to said latent image, and thereafter a step of (iii) uniformly exposing a layer containing at least said formed photopolymerization sensitizing dye image and said polymerizable vinyl monomer to light to form a polymer image in the part where said photopolymerization sensitizing dye image is present, by photopolymerization.

5. An image recording process according to claim **1**, wherein the image recording material is composed of a sheet (**1**) comprising a base support having coated thereon a layer containing silver halide and a reducing agent and a sheet (**2**) comprising a base support having coated thereon a layer containing a photopolymerization sensitizing dye and a polymerizable vinyl monomer, and the step (ii) of heating is carried out in the state that the layer of the sheet (**1**) and the layer of the sheet (**2**) are in contact after the step (i) of image exposure to form a latent image in the sheet (**1**).

4,624,911

SILVER HALIDE DIFFUSION TRANSFER USING PLURAL CYCLIC IMIDE SILVER HALIDE SOLVENTS

Yoshio Idota, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

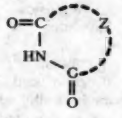
Filed Feb. 27, 1985, Ser. No. 706,532

Claims priority, application Japan, Feb. 27, 1984, 59-35738

Int. Cl.[4] **G03C** *5/54, 5/38*

U.S. Cl. 430—251 **11 Claims**

1. A method for image formation by a diffusion transfer process comprising developing an imagewise light-exposed light-sensitive silver halide emulsion layer in the presence of a developing agent, a silver halide solvent and an alkali to thereby convert at least a part of unexposed silver halide of the emulsion layer to a transferable silver complex salt and transferring at least a part of the silver complex salt to an image-receiving layer containing a silver precipitant to form a silver image on the image-receiving layer, wherein at least two cyclic imide compounds represented by the following formula (I) are used as the silver halide solvent:



wherein Z represents an atomic group necessary to form a substituted or unsubstituted 5- or 6-membered imido ring containing from 1 to 3 nitrogen atoms, where when the imido ring formula (I) is substituted it is substituted with an unsubstituted amino group, an alkyl group, a halogen atom or a carboxyl group and wherein each of the cyclic imide compounds is used at a molar ratio of about 1/100 or more to the total cyclic imide compounds.

4,624,912

THERMALLY TRANSFERABLE LAYERS OF RADIATION SENSITIVE EPOXY RESINS USED TO PREPARE PROTECTIVE COATINGS AND RELIEF IMAGES

Hans Zweifel, Basel; Sigrid Bauer, Lutry, and Kurt Meier, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 6, 1985, Ser. No. 698,952

Claims priority, application Switzerland, Feb. 10, 1984, 631/84

Int. Cl.[4] **G03C** *11/12, 5/16;* **B44C** *1/165*

U.S. Cl. 430—258 **20 Claims**

1. A process for the production of a protective layer on a substrate which comprises

thermally transferring, by the application of pressure and heat at a temperature of up to 150° C., a radiation-sensitive layer from support to the substrate, which layer consists essentially of

(a) a solid film-forming epoxy resin,

(b) 0.1 to 15% by weight, based on the epoxy resin, of a cationic photoinitiator; and

(c) 0 to 10% by weight, based on the epoxy resin, of a photo sensitizer,

exposing directly said layer to radiation by an electron beam or actinic light, and then

heating the layer after irradiation to harden said layer.

11. A process for the production of a relief image on a substrate which comprises

thermally transferring, by the application of pressure and heat at a temperature of up to 150° C., a radiation-sensitive

layer from a support to the substrate, which layer consists essentially of

(a) a solid film-forming epoxy resin,

(b) 0.1 to 15% by weight, based on the epoxy resin, of a cationic photoinitiator, and

(c) 0 to 10% by weight, based on the epoxy resin, of a photo sensitizer,

exposing said layer through a photomask to radiation by an electron beam or actinic light,

heating the layer after irradiation to harden the radiation-exposed parts of said layer, and then

developing the relief image with an organic solvent.

4,624,913

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Nobuaki Miyasaka; Koki Nakamura, and Shigeki Yokoyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

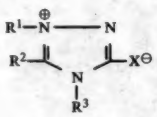
Filed Feb. 11, 1985, Ser. No. 700,251

Claims priority, application Japan, Feb. 9, 1984, 58-22621

Int. Cl.[4] G03C *1/38, 5/24, 1/34*

U.S. Cl. 430—444 **30 Claims**

1. A wet developable silver halide photographic light-sensitive material comprising at least one light-sensitive silver halide emulsion layer on a support, wherein the emulsion in said light-sensitive silver halide emulsion layer comprises a silver iodobromide emulsion containing 3 mol % or more of iodide, and at least one of said light-sensitive emulsion layer or another hydrophilic colloid layer contains a polyoxyethylene surface active agent and at least one of said light-sensitive emulsion layer or another hydrophilic colloid layer contains a mesoionic triazolium compound represented by formula (I)



(I)

wherein X represents a sulfur ion or —N—R^4, and R^1, R^2, R^3, or R^4 each represents a hydrogen atom or a substituted or nonsubstituted alkyl group, aryl group, or heterocyclic group, or R^1 and R^2, R^2 and R^3 or R^3 and R^4 can together form a heterocyclic ring.

4,624,914

OPTICAL INFORMATION RECORDING MEDIUM OF TE, O AND PD AND METHOD FOR MAKING SAME

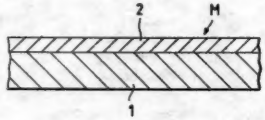
Kunio Kimura, 5-1-612, Makino Kita-machi, Hirakata-shi, Osaka; Masatoshi Takao, 1-1-3, Setoguchi, Hirano-ku, Osaka-shi, Osaka; Nobuo Akahira, 13-6, Otokoyama Kanaburi, Yawata-shi, Kyoto, and Mutsuo Takenaga, 12-305, 4-chome, Ikuno, Katano-shi, Osaka, all of Japan

Filed Sep. 12, 1985, Ser. No. 775,302

Claims priority, application Japan, Sep. 13, 1984, 59-192003

Int. Cl.[4] G03C *1/72, 1/74;* **B32B** *7/00*

U.S. Cl. 430—495 **11 Claims**



1. An optical information recording medium comprising a substrate and a photosensitive thin layer formed on said substrate and consisting essentially of from 5 to 40 atm% of Pd, from 20 to 60 atm% of O and the balance of Te, said O and Te forming a mixture of Te and TeO_2.

4,624,915

POSITIVE SELECTION SORTING OF CELLS

Melvin S. Schindler, Okemos, and John F. Holland, Lansing, both of Mich., assignors to Board of Trustees of Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 403,154, Jul. 29, 1982. This application Jul. 14, 1983, Ser. No. 513,995

Int. Cl.[4] C12N *5/00;* **C12M** *1/34;* **C12Q** *1/00*

U.S. Cl. 435—4 **8 Claims**

1. A method of sorting and separating a heterogeneous population of anchorage dependent living cells comprising:

(a) providing a film support for the attachment of a heterogeneous population of cells on an underlying surface;

(b) automatically applying a radiant energy beam at a first intensity to all of said cells on said film support;

(c) identifying subsets of said cells in said heterogeneous population of cells by response to said beam, with a discriminating means;

(d) isolating said cells and subsets of said cells of said heterogeneous population of cells by circumscribing desired cells on said film support with a radiant energy beam at a second intensity whereby the film is thermally fused to the underlying surface thereby enabling physical separation by film removal;

(e) providing selected plural energy levels of said beam to said film support with a control means for selected irradiation, circumscription and isolation of selected cells on said film support surface as indicated by said discriminating means and isolation of selected encountered cells by a circumscribing application of a selected second energy intensity of said beam.

4,624,916

PROCESS AND COMPOSITION FOR THE RAPID QUANTITATION OF SMALL LEVELS OF CREATIVE KINASE-MB ISOENZYME

Vipin D. Shah, and Nila V. Shah, both of Saratoga, Calif., assignors to International Immunoassay Laboratories, Inc., Santa Clara, Calif.

Filed Apr. 6, 1984, Ser. No. 597,593

Int. Cl.[4] A61K *39/00;* **G01N** *33/53*

U.S. Cl. 435—7 **16 Claims**

1. A two site immunometric sandwich assay method for the assay of creatine phospho kinase-MB(CK-MB) in human serum comprising:

(a) reacting a serum specimen suspected of containing CK-MB with a matrix to form a first reaction solution, said matrix including;

1. a solid-phase having an antibody to an isoenzyme selected from the group consisting of CK-MM and CK-BB bound to the surface of said solid phase; and

2. a liquid phase surrounding said solid phase including therein a substantial component of pooled human serum;

(b) separating the solid phase portion of said first reaction solution from the liquid portion thereof;

(c) reacting said solid-phase portion from said first reaction solution with tracer including a labeled antibody being drawn against the remaining isoenzyme not selected in step (a) hereinabove;

(d) separating the solid-phase portion of the second reaction solution from the liquid portion thereof;

(e) testing said solid-phase portion from said second reaction solution to detect the tracer as an indication of the presence of CK-MB.

4,624,917

PROCESS FOR THE PRODUCTION OF HUMAN T-CELL GROWTH FACTOR

Kaname Sugimoto, Okayama, Japan, assignor to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Continuation of Ser. No. 349,692, Feb. 17, 1982, abandoned.
This application Jan. 23, 1984, Ser. No. 572,616
Int. Cl.[4] C12P *21/00;* C12N *15/00, 5/00, 5/02*
U.S. Cl. 435—68 20 Claims

1. In a process for producing human T-cell growth factor (hTCGF) which comprises culturing human cells capable of producing hTCGF on an in vitro nutrient culture medium under conditions which permit accumulation of a substantial amount of hTCGF, and recovering the accumulated hTCGF from the culture, the improvement whereby the hTCGF production can be extremely enhanced, wherein said human cells capable of producing hTCGF are obtained by the process comprising:

fusing parent human cells inherently capable of producing hTCGF with a human B-lymphoblastoid line to obtain a hybridoma line having an hTCGF producibility higher than that of the parent human cells;

implanting said hybridoma line in an immunodeficent or immunosuppressed non-human warm-blooded animal;

feeding the animal to allow said hybridoma line to utilize the nutrient body fluid of the animal for its multiplication; and

extracting and disaggregating the resultant tumor formed in the animal.

4,624,918

PURIFICATION PROCESS FOR HEPATITIS SURFACE ANTIGEN AND PRODUCT THEREOF

Robert D. Hershberg, San Francisco, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Filed Jul. 9, 1984, Ser. No. 629,295
Int. Cl.[4] C12P *21/00;* A61K *39/29*
U.S. Cl. 435—68 2 Claims

1. A process for purifying HBsAg having 226 amino acid residues, comprising the steps of:

(a) separating the HBsAg from host cell debris in a recombinant cell culture medium producing the HBsAg,

(b) concentrating the separated HBsAg from step (a) by ultrafiltration,

(c) adding ammonium sulfate to the concentrate from step (b) to an ammonium sulfate concentration of about 60% of saturation,

(d) redissolving the precipitated HBsAg from step (c),

(e) passing the separated HBsAg through an immunoaffinity adsorbent column containing monoclonal antibody specific for HBsAg to adsorb the HBsAg and remove contaminants,

(f) releasing the adsorbed HBsAg by passing an eluent through the column, and

(g) fractionating the HBsAg in said eluent by passing the same through an anion exchange bed to yield at least one purified HBsAg-containing fraction.

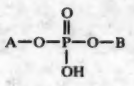
4,624,919

ENZYMATIC PRODUCTION OF PHOSPHOLIPID-SACCHARIDE DERIVATIVES

Yoshitaka Kokusho, Kunitachi; Shigeaki Kato, and Haruo Machida, both of Hino, all of Japan, assignors to Meito Sangyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 10, 1984, Ser. No. 598,699
Claims priority, application Japan, Apr. 11, 1983, 58-63306
Int. Cl.[4] C12P *19/00, 9/00;* C07H *11/04*
U.S. Cl. 435—74 15 Claims

1. A process for producing a saccharide derivative of a phospholipid, which comprises reacting a phospholipid represented by the following formula

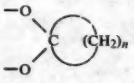


wherein

A is a moiety represented by the following formula (i)

(i)

in which R_1 and R_2 both represent —O—COR_{11} or —O—R_{12}, or R_1 and R_2 in formula (i) together represent



in which n represents a number of from 11 to 19, and R_{11} and R_{12} are identical or different and each represents a saturated or unsaturated aliphatic hydrocarbon group having 7 to 21 carbon atoms, and

B represents the group $-(CH_2)_2N^+(CH_3)_3$, $-(CH_2)_2NH_2$, $-CH_2CH(NH_2)COOH$, $-CH_2CH_2NH(CH_3)$, $-CH_2CH_2N(CH_3)_2$, $-CH_2CHOHCH_2OH$ or $-(CH_2)_mH$

in which m represents a number of from 1 to 5, with a monosaccharide having 5 to 7 carbon atoms, at least one primary alcohol group and at least three hydroxyl groups in total including the OH of the at least one primary alcohol group or a disaccharide thereof, said saccharide being unsubstituted or substituted by a group selected from the class consisting of amino and acetylamino groups, or a phenol glycoside of said saccharide in the presence of phospholipase DM.

4,624,920

PROCESS FOR THE PREPARATION OF DICARBOXYLIC ACID USING MICROORGANISM

Shigeo Inoue; Yoshiharu Kimura, both of Utsunomiya, and Shigehito Adachi, Ichikai, all of Japan, assignors to Chairman of Research Association for Biotechnology, Eiji Suzuki, Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,249
Claims priority, application Japan, Nov. 25, 1983, 58-220683
Int. Cl.[4] C12P *7/44;* C12N *1/20*
U.S. Cl. 435—142 7 Claims

1. A process for preparing a dicarboxylic acid containing from 6 to 22 carbon atoms, which comprises: culturing the microorganism Mycobacterium sp. KSM-B-33 (FERM BP-647), at a temperature in the range of from 40° to 50° C., under aerobic conditions, in a culture medium containing a nitrogen source and containing, as a carbon source, a substance capable of being transformed to said dicarboxylic acid by the action of said microorganism, said substance containing from 6 to 22 carbon atoms and being selected from the group consisting of normal paraffins, fatty acids and lower alkyl esters of said fatty acids, and recovering said dicarboxylic acid that is formed in the culture medium.

4,624,921

HUMAN LYMPHOBLASTOLD CELL LINE AND HYBRIDOMAS DERIVED THEREFROM

James W. Larrick, Woodside; Andrew R. Raubitschek, Palo Alto, and Kenneth E. Truitt, San Diego, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Apr. 26, 1984, Ser. No. 604,068
Int. Cl.[4] C12N *15/00, 5/00;* C12R *1/91*
U.S. Cl. 435—172.2 8 Claims

3. A monoclonal antibody-producing human×human hybridoma of:

(a) a human lymphoblastoid B cell of the line LTR228 or a progeny thereof; and

(b) an antibody-producing human cell.

4,624,922

PLASMID, METHOD FOR CONSTRUCTION OF THE SAME, MICROORGANISM CARRYING THE PLASMID AND METHOD FOR CULTIVATION OF THE MICROORGANISM

Koki Horikoshi; Toshiaki Kudo, both of Tokyo, and Hiroshi Honda, Hino, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Filed Mar. 19, 1984, Ser. No. 590,636
Claims priority, application Japan, Dec. 9, 1983, 58-232507; Dec. 9, 1983, 58-232508
Int. Cl.[4] C12N *15/00, 1/00, 1/20;* C12P *19/34*
U.S. Cl. 435—172.3 15 Claims

1. A recombinant plasmid which is capable of inducing the extracellular secretion of xylanase in *Escherichia coli* transformed with said plasmid and which is obtained by inserting a chromosomal DNA fragment of Bacillus sp. C125 coding for extracellular secretion of xylanase, at restriction sites for a vector plasmid DNA.

4,624,923

METAL-COATED POLYALDEHYDE MICROSPHERES

Shlomo Margel, Rehovot, Israel, assignor to Yeda Research and Development Company Limited, Rehovot, Israel

Continuation-in-part of Ser. No. 618,494, Jun. 8, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 822,774
Int. Cl.[4] C12N *11/14*
U.S. Cl. 435—176 9 Claims

1. A metal-coated polyaldehyde microsphere comprising a preformed polyaldehyde microsphere coated with a transition metal in elemental form, the transition metal being bound to the preformed polyaldehyde microsphere by either direct bonding to the aldehyde groups of the microsphere or by ionic or coordinate bonding to primary amines which are covalently bound to the aldehyde groups of the microsphere.

4,624,924

NOVEL COLLAGENASE "DISCOLYSIN" AND PRODUCTION METHOD THEREOF

Akira Endo, Tokyo, Japan, assignor to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,637
Claims priority, application Japan, Mar. 9, 1984, 59-45292
Int. Cl.[4] C12N *9/52*
U.S. Cl. 435—220 4 Claims

1. A collagenase "discolysin" having the following physical and chemical properties and produced by culturing a bacterium belonging to the genus of Streptomyces in a culture medium and then collecting discolysin from the culture medium:

(1) Molecular weight: 60,000–70,000 (SDS-Gel electrophoresis); 90,000–110,000 (SDS-Gel electrophoresis; presence of 10 mM EDTA);

(2) Formation of two collagenase-active bands by disc gel electrophoresis;

(3) Isoelectric point: pH 4.8 and 4.9 (determined by focal electrophoresis);

(4) Elemental analysis data: C, about 43%; H, about 7%; N, about 13%;

(5) U.V. spectrum: FIG. 1;

(6) I.R. spectrum: FIG. 2;

(7) Precipitated by 45–81% saturation with ammonium sulfate;

(8) Adsorbed on an ion exchanger, DEAE cellulose;

(9) Decomposes insoluble collagens and denatured collagen but is extremely inert to casein;

(10) Optimum pH for decomposition of insoluble collagens: 7.6–8.0; and

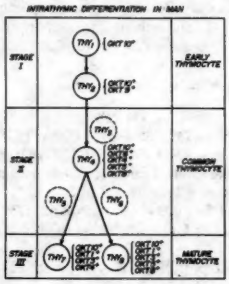
(11) Inhibited by EDTA.

4,624,925

HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO A HUMAN EARLY THYMOCYTE ANTIGENS, ANTIBODY, AND METHODS

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 100,071, Dec. 4, 1979, Pat. No. 4,364,934. This application Oct. 4, 1982, Ser. No. 432,458
Int. Cl.[4] C12N *5/00, 15/00;* C12P *21/00;* A61K *39/359*
U.S. Cl. 435—240 1 Claim



1. A hybridoma having the identifying characteristics of ATCC CRL 8021.

4,624,926

NOVEL CLONING VEHICLES FOR POLYPEPTIDE EXPRESSION IN MICROBIAL HOSTS

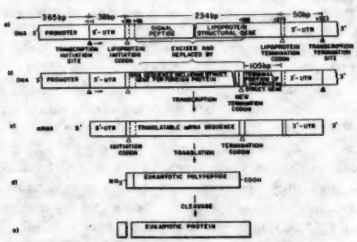
Masayori Inouye, Setauket, N.Y., and Kenzo Nakamura, Tokyo, Japan, assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 222,010, Jan. 2, 1981, abandoned, and a continuation-in-part of Ser. No. 286,070, Jul. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 222,010,. This application Mar. 3, 1982, Ser. No. 354,287
Int. Cl.[4] C12N *1/20, 15/00, 1/00*
U.S. Cl. 435—253 63 Claims

1. A recombinant plasmid suited for use as a cloning vehicle for expression in a transformed bacterial host of at least one polypeptide foreign to *Escherichia coli,* said plasmid comprising a first DNA sequence coding for the amino acid sequence of said at least one polypeptide linked in reading phase with a second DNA sequence coding for at least one functional fragment derived from an outer membrane lipoprotein gene of *Escherichia coli* and selected from the group consisting of (a) the promoter, (b) the 5'-untranslated region, (c) the 3'-untranslated region and (d) the transcription termination signal of said lipoprotein gene, said second DNA sequence including at least the promoter of said lipoprotein gene.

2. A recombinant plasmid suited for use as a cloning vehicle for expression in a transformed bacterial host of at least one polypeptide foreign to *Escherichia coli,* said plasmid comprising a first DNA sequence coding for at least one functional

fragment derived from an outer membrane lipoprotein gene of *Escherichia coli* and selected from the group consisting of (a) the promoter, (b) the 5'-untranslated region, (c) the 3'-untranslated region and (d) the transcription termination signal of said lipoprotein gene, said first DNA sequence including at least the promoter of said lipoprotein gene, said plasmid further comprising a second DNA sequence bearing no complete lipoprotein structural gene and linked in reading phase with said first DNA sequence and coding for a translation initiation codon adjacent the recognition sequence of at least one restriction endonuclease for incorporation in said plasmid of the DNA sequence coding for the amino acid sequence of said at least one polypeptide.



4,624,927

REAGENT FOR DETERMINATION OF BLOOD COAGULATION FACTOR XIII

Tsunekazu Fukushima; Mitsugu Fujii; Satoshi Funakoshi, and Tadakazu Suyama, all of Osaka, Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Apr. 16, 1984, Ser. No. 600,740

Claims priority, application Japan, Apr. 15, 1983, 58-66609

Int. Cl.[4] G01N *31/00, 33/556*

U.S. Cl. 436—16 **6 Claims**

1. A reagent for determination of human blood coagulation factor XIII for reversed passive hemagglutination reaction which comprises sensitized erythrocytes prepared by sensitizing animal erythrocytes with specific anti-human factor XIII antibody.

4,624,928

LIQUID HANDLING PROCESS

Humayun Qureshi, Bedford, Mass., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 1, 1984, Ser. No. 667,300

Int. Cl.[4] G01N *1/10, 1/18*

U.S. Cl. 436—179 **16 Claims**

3. A process for accurately positioning liquid quantity in a plural channel analysis system having a plurality of analysis chamber structures,

inlet port structure for introduction of a liquid sample to be analyzed,

reagent liquid storage structure,

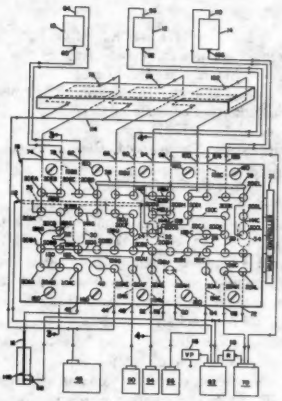
reduced pressure reservoir structure,

flow network structure connected between said sample inlet and said analysis chamber structures,

said flow network structure including a plurality of sample metering chamber structures, a corresponding plurality of reagent liquid metering chamber structures, each said metering chamber structure having a valved inlet and a valved outlet, a distribution manifold connected between said inlet port structure and the inlets of said sample metering chambers for supplying sample liquid to be analyzed to said plurality of sample metering chambers, and a series of valves disposed along said distribution manifold,

said process accurately positioning the leading edge of a liquid quantity to be analyzed in said distribution manifold adjacent the valved inlets of said sample metering chamber structures comprising the steps of

applying reduced pressure from said reservoir structure to reduce pressure in said distribution manifold between the leading edge of the liquid quantity to be positioned and the desired position of said leading edge while a first valve between said inlet and said desired position is closed to prevent movement of said liquid quantity,



closing a second valve to provide a region of reduced pressure trapped in said distribution manifold between the leading edge and said desired position, and

opening said first valve to release said liquid quantity for movement under the influence of said trapped reduced pressure towards said desired position in said distribution manifold.

4,624,929

SAMPLE COLLECTOR AND ASSAY DEVICE AND METHOD FOR ITS USE

Edwin F. Ullman, Atherton, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 3, 1984, Ser. No. 677,144

Int. Cl.[4] G01N *1/10, 1/48*

U.S. Cl. 436—179 **38 Claims**

1. A device for collecting a liquid sample, which device comprises:

a housing,

means attached to said housing for collecting a predetermined amount of a liquid sample, said means comprising a bibulous pad designed to absorb and hold said predetermined amount of liquid sample, and

means attached to said housing for mating said device with a container having a volume of liquid for dilution of said liquid sample and during said mating creating a pressure differential between the interior of said housing and a chamber formed by said mated housing and container, said pressure differential being sufficient to move a prede-

termined volume of the liquid through said means attached to said housing for collecting a predetermined amount of a liquid sample and into said housing.

4,624,930

IMMUNOCHEMICAL PROCESS

Paul Tanswell, Laupheim/Obersulmetingen; Manfred Baier, Pöcking-Possenhofen, and Helmut Lenz, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Jun. 27, 1983, Ser. No. 508,258

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1982, 3225027

Int. Cl.[4] G01N *33/543*

U.S. Cl. 436—500 **14 Claims**

1. A process for the determination of a polyvalent antigen which comprises:

incubating a sample containing polyvalent antigen with three different receptors, said first and third receptors being in a liquid phase and comprising an antibody or fragment thereof, wherein said antibodies or fragments thereof derive from the same species, said second receptor being present in a solid phase, the first and third receptors specifically binding to the antigen and said second receptor specifically binding with the first receptor, said third receptor further comprising a marking and not cross-reactive with said first and second receptors;

said incubation taking place under conditions favoring formation of antigen receptor complexes, and;

separating the liquid and solid phases following complex formation, and measuring the amount of labeled receptor in either the liquid or solid phase.

4,624,931

RECOGNINS AND THEIR CHEMORECIPROCALS

Samuel Bogoch, 46 E. 91st St. (A), New York, N.Y. 10028

Continuation of Ser. No. 288,296, Jul. 30, 1981. This application Oct. 3, 1983, Ser. No. 519,598

The portion of the term of this patent subsequent to Mar. 25, 1997, has been disclaimed.

Int. Cl.[4] G01N *33/544, 33/53;* **A61K** *39/00*

U.S. Cl. 436—528 **17 Claims**

1. A process for the production of polypeptide products, Recognins, from nerve tissue which comprises extracting normal or diseased animal nerve tissue or cells with a neutral buffer by repeated disruption of the tissue or cells to solubilize protein fractions, separating from the resulting extract of solubilized proteins the fraction having a pK range of from about 1 to 4, and isolating therefrom a product having a molecular weight of from about 3,000 to about 25,000, said products, Recognins, characterized by forming a single line precipitate with their specific antibodies in quantitative precipitin tests and Ouchterlony gel diffusion tests, being soluble in water and aqueous solutions having an acid or neutral pH, and insoluble at an alkaline pH, having a spectrophotometric absorption peak wave length of 280 mu and a molecular weight of from about 3,000 to about 25,000, and further characterized by having an amino acid residue composition characterized by high proportions of glutamic and aspartic acids and high ratios of glutamic and aspartic acids to histidine.

4,624,932

RECOGNINS AND THEIR CHEMORECIPROCALS

Samuel Bogoch, 46 E. 91st St., New York, N.Y. 10028

Continuation of Ser. No. 941,940, Sep. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 553,075, Feb. 25, 1975, abandoned, and a continuation-in-part of Ser. No. 550,432, Feb. 18, 1975, abandoned, and a continuation-in-part of Ser. No. 450,404, Mar. 12, 1974, abandoned, and a continuation-in-part of Ser. No. 385,451, Aug. 3, 1973, abandoned. This application Jul. 30, 1981, Ser. No. 288,296

Int. Cl.[4] G01N *33/537, 33/536, 33/53;* **A61K** *39/00*

U.S. Cl. 436—538 **17 Claims**

1. A process for the production of a product, Astrocytin, which comprises extracting brain glioma tumor tissue with a neutral buffer by repeated disruption of the tissue to solubilize protein fractions, separating from the resulting extract of solubilized proteins the fraction having a pK range of from about 1 to 4, and isolating therefrom a product having a molecular weight of about 8000, said product, Astrocytin, characterized by forming a single line precipitate with its specific antibody in quantitative precipitin tests and Ouchterlony gel diffusion tests, being soluble in water and aqueous solutions having an acid or neutral pH, and insoluble at an alkaline pH, having a spectrophotometric absorption peak wave length of 280 mu, a molecular weight of about 8000 and further having an amino acid composition approximately as follows:

	Approximate Number of Residues
Aspartic Acid	9
Threonine	5
Serine	6
Glutamic Acid	13
Proline	4
Glycine	6
Alanine	9
Valine	4
½ Cysteine	2
Methionine	1
Isoleucine	2
Leucine	8
Tryosine	2
Phenylalanine	3
Lysine	8
Histidine	2
Arginine	4
	Approximate Total = 88

the amino acids cysteic acid, hydroxyproline, norleucine, ammonia, isodesmosine, desmosine, hydroxylysine, lysinonorleucine and gamma-aminobutyric acid being absent in detectable amounts.

4,624,933

SODIUM FLUORMICA GLASS-CERAMICS

George H. Beall, Big Flats; Robert C. Doman, Painted Post, and Linda R. Pinckney, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,382

Int. Cl.[4] C03C *10/16*

U.S. Cl. 501—3 **2 Claims**

1. A family of glass-ceramic compositions having as a principal crystal phase a sodium fluoromontmorillonoid phase or a solid solution of the sodium fluoromontmorillonoid and fluoride talc, wherein the glass-ceramic undergoes swelling upon exposure to water and may be readily delaminated to form a gel, the parent glasses being capable of spontaneous crystalliza-

tion on cooling and consisting essentially, on a calculated chemical bases, of 55–60% SiO_2, 23–26% MgO, 6.3–8.7%

Na_2O, and 9–11% analyzed F, and being essentially potassium-free and lithium-free.

4,624,934

CERAMIC COMPOSITION FOR MULTILAYER PRINTED WIRING BOARD

Yoshinori Kokubu, Tokyo, and Jiro Chiba, Yokohama, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 729,066

Claims priority, application Japan, May 4, 1984, 59-88459

Int. Cl.[4] C03C *8/20, 8/16, 14/00, 3/066*

U.S. Cl. 501—17 **7 Claims**

1. A ceramic composition for a multilayer printed wiring board, consisting essentially of:

(A) from 35–95% by weight of a glass powder consisting essentially of from 25–40% by weight SiO_2, from 4–15% by weight Al_2O_3, from 15–25% by weight B_2O_3, from 15–40% by weight of BaO+CaO+MgO, from 1–10% by weight ZnO and from 0.5–5% by weight ZrO_2; and

(B) from 5–65% by weight of a refractory filler powder being a material selected from the group consisting of alpha-quartz, corundum, zircon, stabilized zirconia and zirconia.

4,624,935

DIELECTRIC CERAMIC COMPOSITION

Yukio Sakabe, Kyoto; Goro Nishioka, Takatsuki, and Junichi Imanari, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 25, 1985, Ser. No. 791,302

Claims priority, application Japan, Oct. 31, 1984, 59-230799

Int. Cl.[4] C04B *35/49*

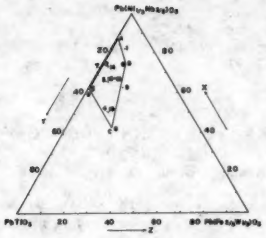
U.S. Cl. 501—134 **5 Claims**

1. A dielectric ceramic composition consisting essentially of a ternary component system expressed by the general formula:

$$xPb(Ni_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3\text{-}yPbTiO_3\text{-}zPb(Fe_{\frac{1}{2}}W_{\frac{1}{2}})O_3$$

where x, y and z are proportions in mole % of the three components and x+y+z=100, the proportions of x, y and z falling in the area defined by a polygon ABCD encompassed by the points A, B, C and D shown in FIG. 1, the sets of proportions in mole % of the three components at the vertices, A,B,C and D of said polygon being as follows:

	x	y	z
A	87.0	12.5	0.50



-continued

	x	y	z
B	75.0	15.0	10.0
C	42.5	37.5	20.0
D	62.0	37.5	0.50

4,624,936

METHOD FOR PREPARING HYDROCARBON CATALYTIC CRACKING CATALYST COMPOSITIONS

Goro Sato; Masamitsu Ogata, both of Kita-Kyushu, and Toshiharu Hirai, Munakata, all of Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 714,150

Claims priority, application Japan, Mar. 21, 1984, 59-53897

Int. Cl.[4] B01J *29/06, 37/00*

U.S. Cl. 502—65 **7 Claims**

7. A method for preparing a catalytic cracking catalyst composition, which consists essentially of the steps of: preparing an aqueous slurry containing a precursor of a porous siliceous matrix selected from the group consisting of silica, silica-alumina and silica-magnesia and a crystalline aluminosilicate zeolite selected from the group consisting of hydrogen-exchanged zeolite, rare earth-exchanged zeolite and ammonium-exchanged zeolite, spray-drying said slurry to obtain fine spherical particles, washing said particles to reduce the alkali metal content thereof to 1.0 wt.% or less, calculated as the oxide, then drying said particles, then impregnating said particles with an aqueous solution of at least one water-soluble compound selected from the group consisting of the chlorides, sulfates, nitrates and acetates of titanium, zirconium and hafnium, and then drying said particles, said particles containing from 5 to 50 wt.% of said crystalline aluminosilicate zeolite and from 0.3 to 8.0 wt.% of titanium, zirconium or hafnium, calculated as the oxide.

4,624,937

PROCESS FOR REMOVING SURFACE OXIDES FROM ACTIVATED CARBON CATALYST

Shine K. Chou, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 608,831, May 10, 1984, abandoned. This application Feb. 28, 1985, Ser. No. 705,391

Int. Cl.[4] C01B *31/10;* **B01J** *21/18;* **C07F** *9/02;* **C07C** *85/11*

U.S. Cl. 502—180 **3 Claims**

1. A process for preparing an activated carbon catalyst for catalytically oxidizing tertiary amines and secondary amines in the presence of oxygen or an oxygen containing gas to selectively produce secondary amines and primary amines which comprises pyrolyzing activated carbon at a temperature in the range of about 800° C. to about 1200° C. while simultaneously passing over the activated carbon a gas stream comprised of an oxygen-containing gas and NH_3 wherein the oxygen-containing gas/NH_3 is in a ratio of up to 90:10 for a time sufficient to remove surface oxides from the carbon.

2. The process of claim 1 wherein the oxygen-containing gas is selected from the group consisting of H_2O, NO_x, O_2, CO_2, SO_2 and mixtures thereof.

3. The process of claim 1 wherein the oxygen-containing gas stream is NH_3/H_2O.

4,624,938

PROCESS FOR PRODUCING WIDE-PORE CATALYST SUPPORTS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 26, 1985, Ser. No. 727,975

Int. Cl.[4] B01J *27/18, 27/16;* **C01F** *7/02*

U.S. Cl. 502—208 **15 Claims**

1. A process for the preparation of wide-pore alumina supports having surface areas above about 300 m^2/g, at least about 20% of the pore volume located in pores greater than about 350 Å and at least about 20% of pores less than about 70 Å in diameter, a crush strength greater than about 10 lbs. and containing an amount of phosphorus in the range from about 0.1% to about 5.0% by weight, which process comprises:

(a) concurrently titrating an acid aluminum salt in an aqueous solution with a basic aluminum compound in an aqueous solution, thereby forming a precipitate,

(b) adding a phosphorus-containing compound to the precipitate and adjusting the pH to a range between about 9.0 and about 11.0,

(c) aging the precipitate at the adjusted pH at a temperature in the range between about 20° C. and about 90° C. for at least 15 minutes,

(d) washing the precipitate,

(e) drying the precipitate, and

(f) calcining the precipitate at a temperature ranging from about 300° C. to about 900° C.

3. The process of claim 1 wherein the precipitation is carried out at a pH in the range between about 5.5 to about 10.0.

13. A process for the preparation of wide-pore alumina supports having surface areas above about 300 m^2/g, at least about 20% of the pore volume located in pores greater than about 350 Å and at least about 20% of pores less than about 70 Å, a crush strength greater than about 10 lbs. and containing an amount of phosphorus in the range from about 0.1% to about 5.0% by weight, which process comprises:

(a) concurrently titrating an acid aluminum salt selected from the group consisting of aluminum sulfate, nitrate or chloride in an aqueous solution with an alkali metal aluminate in an aqueous solution, thereby forming a precipitate,

(b) adding a phosphorus-containing compound selected from the group consisting of phosphoric acid, ammonium phosphate and mixtures thereof to the precipitate and adjusting the pH to a range between about 9.5 and about 10.5,

(c) aging the precipitate at the adjusted pH at a temperature in the range between about 50° C. and about 85° C. for at least 15 minutes,

(d) washing the precipitate,

(e) drying the precipitate, and

(f) calcining the precipitate at a temperature ranging from about 300° C. to about 900° C.

4,624,939

CATALYST AND METHOD OF MAKING SAME FOR OXIDATION OF PRIMARY AMINES TO OXIMES BY ELEMENTAL OXYGEN

Jean Yamanis, Morris Township, Allegheny County; Emery J. Carlson, Chatham, and John N. Armor, Hanover Township, Morris County, all of N.J., assignors to Allied Corporation, Morris Township, Allegheny County, N.J.

Division of Ser. No. 451,701, Dec. 20, 1982, Pat. No. 4,560,797.

This application Sep. 27, 1985, Ser. No. 780,857

Int. Cl.[4] B01J *21/04, 21/06, 23/30, 27/18*

U.S. Cl. 502—210 **10 Claims**

1. A method for the preparation of a catalyst comprising an oxygen-containing tungsten compound and an alumina aquagel for oxidation of saturated aliphatic or alicyclic primary amines having 2 to 12 carbon atoms to oximes comprising:

(a) contacting at least about 1.0 to about 20.0 times the stoichiometric amount of water required to form $Al(OH)_3$ with about a stoichiometric amount of a hydrolyzable aluminum compound in the presence of an effective amount of an oxygen-containing tungsten substance for a time sufficient to form an alumina aquagel containing said tungsten substance;

(b) heating said aluminum aquagel in the presence of elemental oxygen at a temperature at least about 400° C. for a time sufficient to produce an activated catalyst comprising an oxygen-containing tungsten compound and an alumina aquagel substantially free of carbon.

4,624,940

HIGH TEMPERATURE CATALYST COMPOSITIONS FOR INTERNAL COMBUSTION ENGINE

Chung-Zong Wan, Somerset, and Joseph C. Dettling, Howell, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Filed Apr. 12, 1985, Ser. No. 722,905

Int. Cl.[4] B01J *21/04, 23/10, 23/44*

U.S. Cl. 502—251 **14 Claims**

1. A catalyst effective at least for oxidation of carbon monoxide and unburned hydrocarbons in an exhaust stream, said catalyst remaining effective after exposure to a temperature greater than 1000° C., said catalyst comprising particles from each of the following three classes dispersed on a ceramic monolithic substrate:

(a) stabilized gamma alumina support particles having palladium dispersed thereon, said gamma alumina support particles being stabilized by a method selected from the group consisting of:

(i) incorporation of a combination of lanthana and baria into said particles and

(ii) impregnation of said particles with an aqueous dispersion of a high molecular weight polyorganosiloxane followed by heating to a temperature which is effective to decompose said polyorganosiloxane;

(b) promoter particles effective for promotion of combustion of carbon monoxide, said promoter consisting essentially of an oxide selected from the group consisting of bulk ceria, bulk zirconia and mixtures thereof; and

(c) washcoat stabilization particles consisting essentially of a mixed oxide selected from the group consisting of cordierite, mullite, and magnesium aluminum titanate.

4,624,941

PROCESS OF MANUFACTURING A CATALYST FOR PURIFYING THE EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES AND CATALYST PREPARED BY THE PROCESS

Malte Berndt, and Dieter Ksinsik, both of Sinsheim-Rohrbach, Fed. Rep. of Germany, assignors to DODUCO K.G. Dr. Eugen Durrwachter, Pforzheim, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 781,764

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436400

Int. Cl.[4] B01J *21/04, 23/10, 23/38*

U.S. Cl. 502—302 **18 Claims**

1. In a process of manufacturing a catalyst for purifying exhaust gases of internal combustion engines, which catalyst comprises

a skeleton comprising sintered alumina,

at least one rare earth element oxide distributed in said alumina to stabilize the same, and

at least one finely dispersed noble metal carried by said skeleton on the surface thereof,

the improvement residing in that

a composite powder comprising at least one noble metal and

at least one rare earth element oxide is produced in that a solution containing in solution at least one noble metal salt and at least one rare earth element salt is subjected to spray pyrolysis in contact with oxygen and

said composite powder is applied and sintered to said skeleton in a surface layer thereof.

4,624,942

IRON ON MIXED ZIRCONIA-TITANIA SUBSTRATE FISCHER-TROPSCH CATALYST AND METHOD OF MAKING SAME

Paul N. Dyer, Allentown; Andrew F. Nordquist, Whitehall, and Ronald Pierantozzi, Macungie, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 3, 1985, Ser. No. 752,203
Int. Cl.[4] B01J *21/06, 23/74, 23/78*
U.S. Cl. 502—330 **19 Claims**

1. A composition comprising porous, solid particles, said particles containing a mixture of zirconium and titanium dioxides, said particles further containing, at least on the surfaces thereof, iron or iron oxide, and said particles still further containing up to 10%, by weight, of an alkali metal compound.

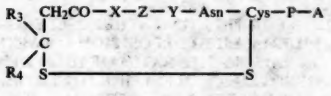
4,624,943

AROMATIC BASIC-TAILED VASOPRESSIN ANTAGONISTS

James F. Callahan, Philadelphia; Michael L. Moore, Media, and Nelson C. Yim, Ambler, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Mar. 20, 1985, Ser. No. 713,732
Int. Cl.[4] A61K *37/34;* **C07K** *7/16*
U.S. Cl. 514—11 **16 Claims**

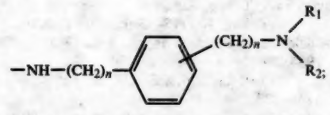
1. A vasopressin antagonist having the formula:



I

in which:

A is



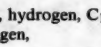
Z is Phe, Phe(4'-Alk), Tyr(Alk) Ile or Tyr;

X is a D or L isomer of Phe, Phe(4'-Alk), Val, Nva, Leu, Ile, Pba, Nle, Cha, Abu, Met, Chg, Tyr or Tyr(Alk);

P is D-Pro-, L-Pro, Δ^3-Pro, L-Ala, N-L-MeAla, Gly, Sar or a single bond;

Y is Val, Ile, Abu, Ala, Chg, Gln, Lys, Cha, Nle, Phe, Leu or Gly;

R_1 and R_2 are, each, hydrogen, C_{1-5}-alkyl; or, when one of R_1 or R_2 is hydrogen,



R_3 and R_4 are, each, hydrogen, methyl or, when taken together, a cycloalkylene ring of 4–6 members taken with the β-carbon to which they are attached; and

n is an integer from 1–3; or a pharmaceutically acceptable, acid addition salt thereof.

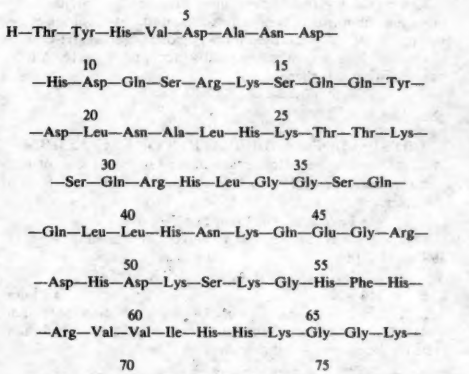
4,624,944

HUMAN SEMINAL ALPHA-INHIBINS

Choh H. Li, Berkeley; David Chung, Castro Valley; R. Glenn Hammonds, Jr., and Kristipati Ramasharma, both of San Francisco, all of Calif., assignors to The Regents of The University of California, Berkeley, Calif.

Filed Jun. 14, 1985, Ser. No. 745,279
Int. Cl.[4] A61K *37/43;* **C07K** *7/10*
U.S. Cl. 514—12 **7 Claims**

1. An essentially pure peptide compound having the formula:



or a nontoxic salt of said peptide.

4,624,945

DISPENSING SYSTEM WITH MEANS FOR INCREASING DELIVERY OF BENEFICIAL AGENT FROM THE SYSTEM

James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 590,778, Mar. 19, 1984, Pat. No. 4,595,583. This application Aug. 9, 1985, Ser. No. 764,143
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—30 **1 Claim**

1. A composition of matter consisting essentially of the beneficial agent ivermectin and a copolymer of 1,2-butylene oxide and ethylene oxide.

4,624,946

TREATMENT OF INVOLUTIONAL BRAIN SYNDROMES AND MENTAL DECAY

Carlo Scolastico, Milan, and Gabriele Braglia, Carimate, both of Italy, assignors to LPB Istituto Farmaceutico S.p.A., Cinisello Balsamo, Italy

Filed Jul. 31, 1985, Ser. No. 760,955
Claims priority, application Italy, May 8, 1985, 48055 A/85
Int. Cl.[4] A61K *31/685*
U.S. Cl. 514—77 **1 Claim**

1. The method of treatment of a living subject affected by brain involutional syndromes of an essential, vascular or traumatic origin, and of the mental decay in the elderly which consists of administering to said living subject in need of treatment an effective amount of L-alpha-glycerylphosphorylcholine orally or parenterally.

4,624,947

4-DIMETHYLAMINO-1-HYDROXYBUTANE-1,1-DIPHOSPHONIC ACID, SALTS THEREOF, AND PROCESSES THEREFOR

Helmut Blum, Duesseldorf, and Siglinde Hemmann, Meerbusch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 16, 1985, Ser. No. 776,337

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434667

Int. Cl.[4] C07F *9/38;* A61K *31/045*

U.S. Cl. 514—108 **5 Claims**

4. A method of treating a mammal requiring a calcium binding agent comprising treating said mammal with an effective quantity of 4-dimethylamino-1-hydroxybutane-1,1-diphosphonic acid or a pharmaceutically acceptable water-soluble base addition salt thereof.

4,624,948

CRYSTALLINE MODIFICATION OF CEFTAZIDIM

Walter Dürckheimer, Hattersheim am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 16, 1984, Ser. No. 600,773

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313818

Int. Cl.[4] C07D *499/44;* A61K *31/545*

U.S. Cl. 514—206 **3 Claims**

1. Anhydrous crystalline (6R,7R)-7-[(Z)-2-(2-aminothiazol-4-yl)-2-(2-carboxyprop-2-oximino)acetamido]-3-(1-pyridiniummethyl)-3-cephem-4-carboxylate.

4,624,949

DIBENZO[B,D]THIOPYRAN DERIVATIVES, PHARMACEUTICAL COMPOSITION AND USE

Piero Melloni, Bresso; Paolo Salvadori, and Pier P. Lovisolo, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

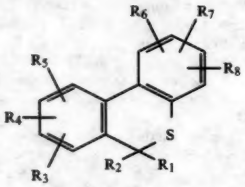
Filed Mar. 4, 1986, Ser. No. 835,946

Claims priority, application United Kingdom, Mar. 6, 1985, 8505756

Int. Cl.[4] A61K *31/38, 31/535;* C07D *35/10, 413/12*

U.S. Cl. 514—222 **10 Claims**

1. A compound of general formula (I)



(I)

wherein

R_1 represents

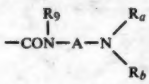
(a) carboxy;

(b) esterified carboxy;

(c) a

group, wherein each of R_a and R_b, being the same or different, is hydrogen or C_1–C_6 alkyl, or R_a and R_b, taken together with the nitrogen atom to which they are linked, form a saturated heteromonocyclic ring, optionally containing a further heteroatom chosen from oxygen, sulphur and nitrogen, wherein the additional nitrogen atom may be unsubstituted or substituted by C_1–C_6 alkyl, pyridyl or by phenyl; or

(d) a



group, wherein R_9 is hydrogen or C_1–C_6 alkyl, A is a C_2–C_6 alkylene chain and R_a and R_b are as defined above;

R_2 represents hydrogen or C_1–C_6 alkyl;

each of R_3, R_4, R_5, R_6, R_7 and R_8, which may be the same or different, is hydrogen, halogen, C_1–C_6 alkyl, C_3–C_4-alkenyloxy or C_1–C_6 alkoxy; and the pharmaceutically acceptable salts thereof.

7. A pharmaceutical composition containing a suitable carrier and/or diluent and, as an active principle, a compound of formula (I) according to claim 1, or a pharmaceutically acceptable salt thereof.

4,624,950

METHOD FOR TREATING ATHEROSCLEROSIS HYPERLIPIDEMA, LIPID DEPOSITION ON ARTERIAL WALLS, OR RAISING THE RATIO OF HIGH DENSITY LIPOPROTEIN CHOLESTEROL TO TOTAL CHOLESTEROL IN SERUM

Tadashi Sasaki, Tokyo; Yoshihiro Fujikawa, Funabashi; Ryozo Sakoda, Kashiwa; Mitsuaki Sakashita, Urawa, and Morihide Hibi, Sagamihara, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

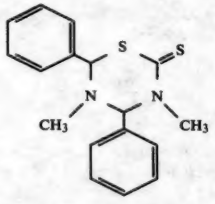
Filed Aug. 13, 1984, Ser. No. 640,120

Claims priority, application Japan, Aug. 19, 1983, 58-152339; Jan. 26, 1984, 59-13044

Int. Cl.[4] A61K *31/38, 31/395*

U.S. Cl. 514—222 **4 Claims**

1. A method of reducing the incidence or severity of atherosclerosis in a mammal comprising administering to said mammal an amount effective to reduce the incidence or severity of atherosclerosis of a pharmaceutical composition comprising 3,5-dimethyl-4,6-diphenyl-tetrahydro-2H-1,3,5-thiadiazine-2-thione having the formula:



and a pharmaceutically acceptable carrier.

4,624,951

SUBSTITUTED PYRIDAZINONES, PHARMACEUTICAL PREPARATIONS CONTAINING THESE COMPOUNDS, AND THE USE THEREOF

Richard Göschke, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

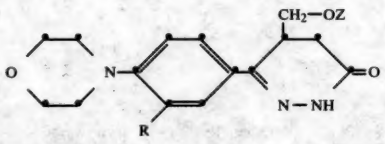
Continuation of Ser. No. 764,286, Aug. 12, 1985, abandoned. This application Jan. 10, 1986, Ser. No. 817,804

Claims priority, application Switzerland, Aug. 17, 1984, 3945/84

Int. Cl.[4] A61K *31/535;* **C07D** *413/10*

U.S. Cl. 514—234 **10 Claims**

1. A pyridazinone of the general formula I



(I)

wherein R is a halogen atom, a lower alkyl or lower alkoxy group, the nitro, hydroxyl, cyano, carboxyl, lower alkoxycarbonyl or carbamoyl group or the trifluoromethyl group, and Z is hydrogen or an acyl group, and the salts and tautomeric forms thereof.

8. A therapeutic composition for the treatment of thrombotic diseases comprising an effective amount of an antithrombotic active compound of formula I as claimed in claim 1 together with a pharmaceutically acceptable excipient.

4,624,952

PYRIDAZINE AND PYRIMIDINE COMPOUNDS ACTIVE ON THE CENTRAL NERVOUS SYSTEM AS SEDATIVES OR ANTICONVULSANTS

Kathleen Bizière, Clapiers; Jean-Pierre Chambon, Montarnaud, and André Hallot, St. Gely du Fesc, all of France, assignors to Sanofi, Paris, France

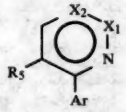
Filed Jan. 16, 1984, Ser. No. 570,832

Claims priority, application France, Jan. 21, 1983, 83 00954

Int. Cl.[4] C07D *401/04, 237/20;* **A61K** *31/445, 31/50*

U.S. Cl. 514—252 **23 Claims**

1. Heterocyclic compounds of formula:



in which:

X_1 represents N or the group

X_2 represents N or the group

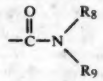
on condition that X_1 and X_2 are different from each other;

R_1 and R_2 represent $-(CH_2)_nOH$; n=1 to 4 or

constitutes a saturated heterocycle with 5 or 6 groupings having one nitrogen atom as heteroatom and being substituted in 3 or 4 position by a group selected from:

(i) a $-(CH_2)_mOR_6$ group where m is equal to 0, 1 or 2 and R_6 represents hydrogen or a group

or

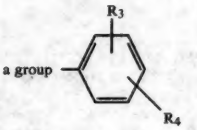


in which R_7 represents a lower alkyl, a cycloalkyl group or a phenyl group optionally substituted by an atom of halogen and R_8 and R_9 considered independently each represent hydrogen or a lower alkyl;

(ii) an oxo (=O) group;

(iii) a spiro-1,3-dioxolane-2-yl group;

Ar represents:



in which

R_3 designates hydrogen, an atom of halogen, a lower alkyl group, a lower alkoxy group, a trifluoromethyl group, a hydroxy group, a nitro group or a cyano group, and R_4 designates hydrogen or an atom of halogen;

a naphthyl group non-substituted or monosubstituted by an atom of halogen;

R_5 designates hydrogen or an atom of halogen, it being understood that R_5 is an atom of halogen only if X_2 represents an atom of nitrogen;

and the salts of said compounds with pharmaceutically acceptable acids.

4,624,953

1-PIPERAZINOCARBOXYLATES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Anders K. Björk, Svalvägen 9, S-237 00 Bjärred, and Erik G. Christensson, Nils Bjelkegatan 3A, S-222 20 Lund, both of Sweden

PCT No. PCT/SE82/00408, § 371 Date Jul. 28, 1983, § 102(e) Date Jul. 28, 1983, PCT Pub. No. WO83/01950, PCT Pub. Date Jun. 9, 1983

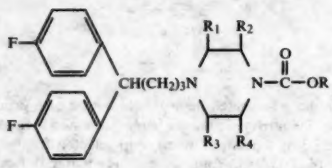
PCT Filed Nov. 30, 1982, Ser. No. 519,761

Claims priority, application Sweden, Dec. 2, 1981, 8107201

Int. Cl.[4] A61K *31/495;* **C07D** *295/10*

U.S. Cl. 514—255 **6 Claims**

1. A compound of formula I:



wherein R is alkyl straight or branch chained having from 1 to 10 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, aralkyl having from 7 to 9 carbon atoms or phenyl unsubstituted or substituted by one to three F, Cl, Br, lower alkyl having from 1 to 5 carbon atoms, lower alkoxy having from 1 to 5 carbon atoms, alkylenedioxy having from 1 to 3 carbon atoms, $-CF_3$ or $-CN$ substituents, R_1–R_4 are independently H, CH_3, C_2H_5 with cis or trans configuration provided that only two of them are other than hydrogen, and provided that R is not ethyl when all of R_1–R_4 are hydrogen, and pharmaceutically acceptable salts thereof.

4. A pharmaceutical composition in dosage unit form which comprises from about 0.1 mg. to about 200 mg. of a compound of formula I as defined in claim 1 in combination with a conventional pharmaceutically acceptable carrier.

4,624,954

6,7,8,9-TETRAHYDRO-10-METHYLPYRIDO[1,2-A]INDOL-9-AMINES AND DERIVATIVES THEREOF, USEFUL FOR THE TREATMENT OF COGNITIVE IMPAIRMENTS

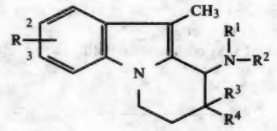
Ivo Jirkovsky, Plainsboro; Gary King, Lawrenceville, both of N.J.; Reinhardt Baudy, Yardley, Pa., and Victor DeNoble, Hamilton, N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,551

Int. Cl.[4] A61K *31/395;* **C07D** *455/03, 403/00*

U.S. Cl. 514—290 **23 Claims**

1. A compound of the structure (I)



(I)

wherein R is hydrogen, lower alkyl, halogen, alkoxy containing 1 to 4 carbon atoms, hydroxy, R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl, cycloalkyl containing 3 to 7 carbon atoms, alkynyl containing 2 to 4 carbon atoms, or, R^1 and R^2 are joined together to form a heterocyclic amine radical, selected from the group consisting of pyrrolidinyl, piperidinyl and morpholinyl, and R^3 and R^4 represent hydrogen, lower alkyl, or alkenyl, wherein lower alkyl and lower alkenyl contain 1 to 4 carbon atoms, and the pharmaceutically acceptable acid addition salt thereof.

23. A method for the treatment of cognitive impairment which comprises administering to a patient requiring such therapy an effective amount of a compound of formula I specified in claim 1, or a pharmaceutically acceptable acid addition salt thereof.

4,624,955

6H-ISOXAZOLO[3,4-D]PYRAZOLO[3,4-B]PYRIDINES, METHOD FOR THEIR PREPARATION AND USE AS ANXIOLYTIC AGENTS

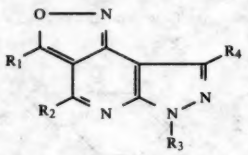
Gregory M. Shutske, Somerset, N.J., assignor to Hoechst-Roussel Pharmaceuticals, Somerville, N.J.

Filed Dec. 23, 1985, Ser. No. 812,484

Int. Cl.[4] A61K *31/415;* **C07D** *498/14, 498/12*

U.S. Cl. 514—293 **29 Claims**

1. A compound having the formula



where R_1 is hydrogen, loweralkyl, arylloweralkyl, aryl or heteroaryl; R_2 is hydrogen or loweralkyl; R_3 is loweralkyl, loweralkoxyloweralkyl, cycloalkyl, arylloweralkyl or heteroarylmethyl; and R_4 is hydrogen or loweralkyl; the term aryl signifying an unsubstituted phenyl group or a phenyl group substituted with 1, 2 or 3 substituents each of which being independently a loweralkyl group, loweralkoxy group, hydroxy group, trifluoromethyl group, chlorine or fluorine, with the proviso that the aryl group shall not have chlorine or fluorine at the ortho position, the term heteroaryl signifying a group having the formula

where Y is O, S, NR_5 or CH=N, R_5 being hydrogen, loweralkyl or phenylloweralkyl, and the term cycloalkyl signifying a cycloalkyl group of 3 to 7 carbon atoms.

27. An anxiolytic composition comprising an effective anxiety alleviating amount of the compound as defined in claim 1 and a carrier therefor.

4,624,956

ULCER AND GASTRIC SECRETION INHIBITING 4,5,6,7-TETRAHYDROTHIAZOLE[5,4-C]PYRIDINE DERIVATIVES

Anna M. Lazzarini, Seregno; Ugo Scarponi, Arese; Roberto de Castiglione, Milan; Roberto Ceserani, Milan; Renato Castello, Milan; Fabrizio Vaghi, Villaguardia, and Daniela Toti, Bettola, all of Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

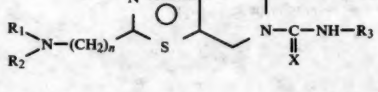
Filed Dec. 11, 1984, Ser. No. 680,566

Claims priority, application United Kingdom, Dec. 16, 1983, 8333514

Int. Cl.[4] A61K *31/445;* **C07D** *513/04*

U.S. Cl. 514—301 **10 Claims**

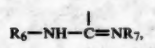
1. A compound of formula I:



wherein n is zero or 1;

either (i) each of R_1 and R_2 independently is a hydrogen atom or an alkyl group of from 1 to 6 carbon atoms, or

(ii) R_2 is a hydrogen atom and R_1 is an amidino group of the formula;



wherein each of R_6 and R_7 independently is a hydrogen atom or a C_3–C_7 cycloalkyl group;

X is an oxygen or sulfur atom, or is an imino, cyanoimino, p-toluenesulfonylimino group or a benzoylimino group; and

R_3 is C_1–C_6 alkyl, C_3–C_7 cycloalkyl, phenyl, phenylethyl, chlorophenyl, benzyl, benzoyl or p-toluenesulfonyl; or a pharmaceutically acceptable acid addition salt thereof.

7. A method for treating peptic ulcers in humans, which method comprises:

administering to a subject in need of such treatment a therapeutically effective amount of the compound of claim 1.

4,624,957

TREATMENT AND PREVENTION OF RETINAL EDEMA WITH DOPAMINERGIC ANTAGONISTS

Ronald A. Schachar, P.O. Box 145, Denison, Tex. 75020

Continuation-in-part of Ser. No. 622,495, Jun. 20, 1984, abandoned. This application Apr. 19, 1985, Ser. No. 725,101

Int. Cl.[4] A61K *31/445*

U.S. Cl. 514—327 **22 Claims**

1. A method of preventing retinal edema due to accumulated fluid leaking from capillary vessels comprising administering to a patient in need thereof a dopaminergic antagonist which is a butyrophenone in an amount which is effective in preventing said edema.

4,624,958

ANTIPROTOZOAL 1,4-DI(P-AMIDINOPHENYL)IMIDAZOLES

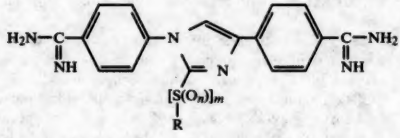
Edward A. Glazer, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 484,803, Apr. 14, 1983, Pat. No. 4,546,113. This application Aug. 28, 1985, Ser. No. 770,328

Int. Cl.[4] A01N *43/50, 43/40;* **C07D** *233/64, 233/84*

U.S. Cl. 514—341 **6 Claims**

1. A compound of the formula



wherein

n is 0, 1 or 2;

m is 0 or 1;

R is (C_1–C_3)alkyl, 2-hydroxyethyl, 2,3-dihydroxypropyl, benzyl or 2-, 3- or 4-picolyl; with the provisos that when R is 4-picolyl, m is 1; and when R is methyl and m is 1, n is other than 0;

or a pharmaceutically acceptable salt thereof.

6. A method of treating a susceptible protozoal infection in a mammal which comprises parenteral administration of an antiprotozoal effective amount of compound of claim 1 in a pharmaceutically acceptable liquid vehicle.

4,624,959

N-{2-[(3-BENZOYL-2-PYRIDYL)-THIO]-ETHYL}-N'-CYANO-S-METHYL-ISOTHIOUREA, AND USE AS ANTI-ULCER AGENTS

Elemér Ezer; Kálmán Harsányi; Hajnalka Vikár née Petho; Judit Matuz; László Szporny; Eszter Cholnoky; Csaba Kuthi; Ferenc Trischler; Béla Hegedüs; Márta Kápolnás née Pap, and Anna Kállay née Sohonyai, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Oct. 3, 1985, Ser. No. 783,842

Claims priority, application Hungary, Oct. 5, 1984, 3777/84

Int. Cl.[4] C07D *213/78*

U.S. Cl. 514—346 **4 Claims**

1. N-{2-[(3-benzoyl-2-pyridyl)-thio]-ethyl}-N'-cyano-S-methyl-isothiourea or a pharmaceutically acceptable acid addition salt thereof.

3. A method of treating gastric oedema in a mammal which comprises the step of administering to said mammal a therapeutically effective amount of the compound defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

4,624,960

SEDATIVE HAVING ANALGESIC AND BRADYCARDIAC PROPERTIES

Otto Kern, and Franz Wilhelm, both of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim Vetmedica GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Oct. 11, 1985, Ser. No. 786,841

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1984, 3437694

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—401 **6 Claims**

1. A method of providing sedation with analgesic and bradycardiac effects to a warm-blooded animal in need of such sedation which comprises administering to said animal as active ingredient an effective amount of 2-((2-bromo-6-fluorophenyl)-imino)-imidazolidine or a pharmacologically acceptable acid addition salt thereof.

4,624,961

METHOD FOR ENHANCING MEMORY OR CORRECTING MEMORY DEFICIENCY WITH ARYLAMIDOPYRAZOLIDINES AND ARYLAMIDODIAZABICYCLOALKANES

William J. Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

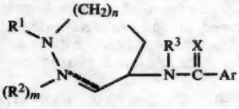
Filed Apr. 17, 1985, Ser. No. 724,324

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—403 **22 Claims**

1. A method of enhancing learning or memory in living animals in need thereof which comprises administering thereto an effective amount for enhancing learning or memory of a compound selected from the group having the formula:

Formula I



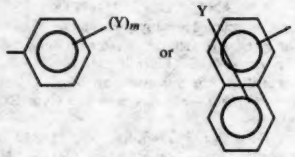
wherein;

n is zero and m is zero or one and when m is zero, the dotted line represents a double bond;

X is oxygen or sulfur;

R^1 and R^2 are hydrogen, loweralkyl, phenyl and phenylloweralkyl, or R^1 and R^2 may fuse to form a second ring, together with the two nitrogen atoms, having three or four methylene groups optically substituted by loweralkyl or phenyl radicals;

R^3 is hydrogen or loweralkyl;
Ar is selected from



Y is hydrogen, loweralkoxy, loweralkylthio, halo, trifluoromethyl, amino, loweralkylamino, diloweralkylamino, acylamino, acyl, aminosulfonyl, loweralkylsulfonyl, nitro, or aminocarbonyl;
m is one to three inclusive;
the active optical isomers; and the pharaceutically acceptable acid addition salts including hydrates and alcoholates thereof.

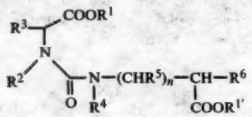
4,624,962

SUBSTITUTED DERIVATIVES OF 2-AZABICYCLO-[3.3.0]OCTANES

Rainer Henning, Frankfurt am Main; Hansjörg Urbach, Kronberg; Rolf Geiger, Frankfurt am Main; Volker Teetz, Hofheim am Taunus, and Bernward Schölkens, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 413,663, Sep. 1, 1982, Pat. No. 4,515,803.
This application Feb. 1, 1985, Ser. No. 697,340
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134933
Int. Cl.[4] A61K *31/40;* **C07D** *209/52*
U.S. Cl. 514—412 **13 Claims**

1. A compound of the formula I



in which
n is a whole number between 0 and 3 inclusive;
R^1 and $R^{1'}$, being the same or different, are hydrogen; alkyl or alkenyl having 1–8 C atoms; phenyl or benzyl, each unsubstituted or monosubstituted by methyl, halogen, methoxy or nitro;
R^2 and R^3 together with the C and N atoms carrying them form a 2-azabicyclo[3.3.0]octane ring system, which is unsubstituted, monosubstituted or distubstituted by hydroxyl, alkoxy having 1–3 C atoms, alkyl having 1–3 C atoms or phenyl;
R^4 is hydrogen; alkyl, alkenyl, alkadienyl, alkynyl, alkeninyl or alkadiynyl having 1–8 C atoms; cycloalkyl having 3–6 C atoms; phenyl, benzyl, phenethyl or phenylpropyl, each of which is unsubstituted, monosubstituted or disubstituted by halogen, hydroxyl, acetoxy, carboxy, carboxamido, sulfonamido, nitro, methyl ethyl, methoxy, ethoxy or methylenedioxy;
R^5 is hydrogen; alkyl having 1–5 C atoms; hydroxyl or alkoxy having 1–3 C atoms;
R^6 is hydrogen; alkyl having 1–12 C atoms; cycloalkyl having 3–12 C atoms; alkenyl having 2–12 C atoms; phenyl or naphthyl, each of which is unsubstituted, monosubstituted or disubstituted by halogen, hydroxyl, acetoxy, carboxy, carboxamido, sulfonamido, nitro, methyl, ethyl, methoxy, ethoxy or methylenedioxy; alkyl having 1–6 C atoms, which is monosubstituted by halogen, hydroxyl, alkoxy having 1–3 C atoms, phenoxy, amino, dialkylamino having 1–6 C atoms, alkanoylamino having 1–3 C atoms, mercapto, alkylthio having 1–3 C atoms, phenylthio, phenylsulfinyl, phenylsulfonyl, phenyl biphenylyl, or naphthyl, the phenyl or naphthyl each being unsubstituted, monosubstituted or disubstituted by halogen, methyl, ethyl, methoxy, ethoxy, nitro, amino, methylamino, dimethylamino, acetylamino, cyano, methylenedioxy or sulfonamido; heteroaryl selected from the group consisting of pyridyl, thienyl, indolyl, benzothienyl, imidazolyl, pyrazolyl and thiazolyl, said heteroaryl being unsubstituted mono-substituted or disubstituted by halogen, methyl, ethyl, methoxy, ethoxy, nitro, amino, methylamino dimethylamino, acetylamino, cyano, methylenedioxy, sulfonamido or phenyl; or physiologically tolerable salts thereof.

11. A method of treatment which comprises administering to a patient suffering from hypertension a hypotensively effective amount of a compound defined in claim 1.

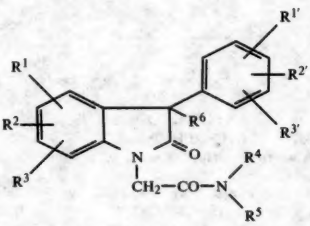
4,624,963

USE OF OXINDOLE COMPOUNDS FOR THE TREATMENT OF EPILEPSY

Hansjörg Kruse, and Heinz Kuch, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 9, 1985, Ser. No. 721,400
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413572
Int. Cl.[4] A61K *31/40, 31/445, 31/495, 31/535*
U.S. Cl. 514—418 **3 Claims**

1. A method of treating epilepsy, which comprises administering to a host which has epilepsy an effective amount of a compound of the formula I



(I)

in which
R^1, R^2, R^3, $R^{1'}$, $R^{2'}$ and $R^{3'}$ are identical or different and independently of one another denote hydrogen, halogen or straight-chain or branched alkyl with 1 to 4 carbon atoms,
R^4 and R^5 are identical or different and independently of one another denote hydrogen or straight-chain or branched alkyl with 1 to 4 carbon atoms; cyclohexyl, alkylcyclohexyl with 1 to 4 carbon atoms in the alkyl part, cycloheptyl or cyclooctyl; phenyl, which can be mono- or di-substituted by halogen, straight-chain or branched alkyl with 1 to 4 carbon atoms, trifluoromethyl, methylenedioxy or alkoxy with 1 to 3 carbon atoms; or phenylalkyl with 1 to 3 carbon atoms in the alkyl part, it being possible for the phenyl nucleus to be substituted as indicated above for phenyl, or hydroxyalkyl with 1 to 4 carbon atoms, or R^4 and R^5, together with the nitrogen atom carrying them, denote pyrrolidino, piperidino, morpholino or phenylpiperazino, it being possible for the phenyl nucleus to be substituted as indicated above for phenyl, and
R^6 denotes hydrogen, alkyl with 1, 2 or 3 carbon atoms or hydroxyl,
or a physiologically acceptable salt thereof.

4,624,964

ARYL OXO-ALKYNOATES AS 5-LIPOXYGENASE INHIBITORS

William J. Sipio, Lindenwold, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 27, 1985, Ser. No. 716,480
Int. Cl.[4] A61K *31/24;* C07C *69/738*
U.S. Cl. 514—539 36 Claims

1. A compound having the formula:

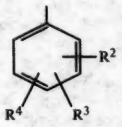
(I)

wherein

R^1 is C_1–C_6 alkyl, C_2–C_6 alkenyl, or phenyl;

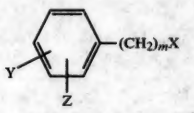
n is 1–12 with the proviso that when n is 6–12 then R^1 is C_1–C_3 alkyl;

Ar is naphthyl or



with the proviso that at least one ortho position is hydrogen;

R^2, R^3 and R^4 independently are H, halogen, CF_3, C_1–C_{12} alkyl, C_2–C_{12} alkenyl, C_1–C_6 alkoxy or



where

m is 0–6;

Y and Z independently are H, Cl, C_1–C_3 alkyl, or C_1–C_3 alkoxy; and

X is O, N-phenyl, or CH_2;

or a pharmaceutically suitable salt thereof.

13. A pharmaceutical composition consisting essentially of a suitable pharmaceutical carrier and a lipoxygenase inhibiting amount of a compound of claim 1.

25. A method of treating inflammation, chronic obstructive lung disease or psoriasis in a mammal which comprises administering to the mammal an effective amount of a compound of claim 1.

4,624,965

NOVEL METHOD OF ADMINISTERING ANTI-NAUSEA AND ANTI-EMETIC PHARMACEUTICAL AGENTS AND NOVEL DOSAGE FORMS CONTAINING SAME

Jeffrey Wenig, Dix Hills, N.Y., assignor to Nastech Pharmaceutical Co., Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 671,694, Nov. 11, 1984, which is a continuation-in-part of Ser. No. 663,891, Oct. 23, 1984, abandoned. This application Oct. 15, 1985, Ser. No. 787,617
Int. Cl.[4] A61K *31/165*
U.S. Cl. 514—619 7 Claims

1. A method of eliciting a systemic, therapeutic, anti-nausea or anti-emetic response in a mammal which comprises nasal administration to said mammal of a systemically, therapeutically effective anti-nausea or anti-emetic amount of metoclopramide, or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable nasal carrier therefor.

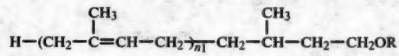
4,624,966

β,γ-DIHYDROPOLYPRENYL ALCOHOL DERIVATIVES AND PHARMACEUTICAL COMPOSITION CONTAINING A POLYPRENYL COMPOUND

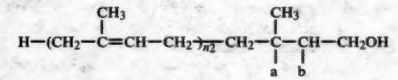
Masaichi Yamamoto, Tokyo; Seiichi Araki; Hiroshi Yamamoto, both of Kawashimamachi; Isao Yamatsu; Takeshi Suzuki, both of Ushikumachi; Akiharu Kajiwara, Ibaragi; Yoshikazu Suzuki, Ichinomiya, and Haruyoshi Arai, Inuyama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 498,235, May 26, 1983. This application Jul. 29, 1985, Ser. No. 760,221
Claims priority, application Japan, May 28, 1982, 57-89806; Jun. 22, 1982, 57-106203; Oct. 21, 1982, 57-183642; Oct. 21, 1982, 57-183643
Int. Cl.[4] A61K *31/045*
U.S. Cl. 514—724 8 Claims

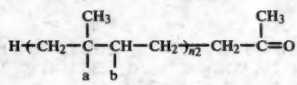
1. A method of improving the resistance of a subject against infection, which comprises: administering to a subject requiring such treatment a therapeutically effective amount of a pharmaceutical composition comprising a pharmaceutically acceptable carrier and a pharmaceutically effective amount of a polyprenyl compound selected from the group consisting of polyprenyl compounds having the following formulae:



wherein n_1 is an integer of 5 to 7 and R is a lower alkyl group, an aliphatic acyl group or an aromatic acyl group;



wherein each of a and b is hydrogen or a and b are combined together to form a bond, and n_2 is an integer of 1 to 10;



wherein each of a and b is hydrogen or a and b are combined together to form a bond, and n_2 is an integer of 1 to 10; 3,7,11,15-tetramethylhexadeca-1-en-3-ol, 3,7,11,15-tetramethyl-1,6,10,14-hexadecatetraen-3-ol, docosanol, phytol and isophytol.

4,624,967

FE-CO CATALYST SLURRY SYSTEM FOR USE IN ALPHA OLEFIN PRODUCTION

Rocco A. Fiato, Scotch Plains; Gary B. McVicker, Califon, both of N.J., and Angelo A. Montagna, Baton Rouge, La., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Dec. 6, 1985, Ser. No. 805,746
Int. Cl.[4] C07C *1/04, 1/06*
U.S. Cl. 518—700 17 Claims

1. A process for synthesizing hydrocarbons containing alpha olefins comprising contacting a gaseous feed mixture of H_2 and CO, in a reaction zone, with a slurry catalyst system at elevated temperature for a time sufficient to convert at least a portion of said gaseous feed to said alpha olefins, wherein said catalysts slurry system is prepared by a process comprising the steps of:

(a) heating a slurry mixture comprised of: a Fischer-Tropsch slurry liquid, an iron carbonyl compound, a cobalt carbonyl compound, or iron and cobalt compounds capable of forming carbonyl complexes in an atmosphere of CO,

and mixtures thereof, and a powdered support, wherein said iron and cobalt compounds are present in a total iron:cobalt atomic ratio of about 35:1 to 1:10, taken as free metals, and wherein the cobalt carbonyl compound has a lower melting point/decomposition temperature than the iron carbonyl compound; in a carbon monoxide atmosphere under pressure, at a temperature above the melting point/decomposition temperature of the cobalt compound for a time sufficient to substantially decompose the cobalt compound; and

(b) heating said slurry mixture from step (a) at a temperature above the melting point/decomposition temperature of the iron compound in said CO atmosphere under pressure, to substantially decompose the iron compound; and

(c) heating said slurry mixture from step (b) in an atmosphere of hydrogen gas to substantially reduce said iron and cobalt carbonyl compounds and their decomposition products to form said catalyst.

4,624,968

MULTI-STAGE FISCHER-TROPSCH PROCESS

Chang J. Kim, Bedminster, and Rocco A. Fiato, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 30, 1985, Ser. No. 814,402

Int. Cl.[4] C07C *1/02*

U.S. Cl. 518—707 **4 Claims**

1. A process for producing paraffinic hydrocarbons from carbon monoxide and hydrogen comprising:

(a) introducing carbon monoxide and hydrogen into a reaction zone wherein the carbon monoxide and hydrogen contact in a first bed a first catalyst having a high olefin selectivity selected from the group consisting of Fe/Ce/Zn/K, Fe/Mn/K and Fe/Co/K; and

(b) contacting the resulting olefin in a second bed with a second catalyst having a high selectivity for converting olefins to heavier paraffinic hydrocarbons selected from the group consisting of Ru/TiO_2, Ru/SiO_2 and Ru/Al_2O_3.

4,624,969

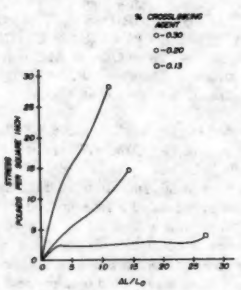
CROSSLINKED SILANE-FUNCTIONAL VINYLIDENE CHLORIDE POLYMER AND FILMS OR FOAMS THEREFROM

Warren L. Treptow, Midland, Mich.; Chung P. Park, Pickerington, Ohio, and Kun S. Hyun, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 18, 1986, Ser. No. 830,038

Int. Cl.[4] C08J *9/18*

U.S. Cl. 521—60 **3 Claims**



1. A process for the preparation of polymeric foam beads suitable for producing molded foam articles comprising the steps of:

(a) reacting vinylidene chloride with a α,β ethylenically unsaturated silane to form a silane functional polymer in pellet or bead form,

(b) impregnating a volatile blowing agent into said silane functional polymer, and

(c) exposing said silane functional polymer to sufficient heat to activate said blowing agent and expand said silane functional polymer to a cellular cross-linked structure.

4,624,970

FOAMING SYSTEM FOR RIGID URETHANE AND ISOCYANURATE FOAMS BASED ON POLYETHERS AND AROMATIC POLYESTER POLYOLS

Frank J. Dwyer, Buffalo, and Leon M. Zwolinski, Orchard Park, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 16, 1985, Ser. No. 734,528

Int. Cl.[4] C08G *18/14, 18/42, 18/76, 18/48*

U.S. Cl. 521—131 **10 Claims**

1. A mixture comprising a foamable polyurethane-forming composition reactive with polyisocyanate comprising from about 20 percent to about 80 percent by weight of an aromatic polyester polyol based on the total polyol composition and from about 80 percent to about 20 percent of a polyether polyol, with a fluorocarbon blowing agent comprising a blend of at least one isomer of dichlorotrifluoroethane and trichlorofluoromethane in a ratio of the dichlorotrifluoroethane to trichlorofluoromethane of from about 1:9 to about 3:7 and wherein the total blowing agent is present in amounts of from about 2 to 40 parts by weight based on the weight of the polyol.

7. A method of producing a rigid polyurethane foam article employing trichlorofluoromethane blowing agent having enhanced solubility in aromatic polyester polyols which comprises:

(a) blending dichlorodifluoromethane with the trichlorofluoromethane in a ratio of about 1:9 to about 3:7, and in admixture with a foamable urethane composition of about 20 to about 80 percent aromatic polyester polyol, the balance being polyether polyol;

(b) combining said mixture with a reaction promoting catalyst and emulsifier to provide a premix; and

(c) mixing the required amount of the above resultant premix with the required amount of isocyanate-containing component to produce a rigid foam article in rigid urethane foam production equipment.

4,624,971

PHOTO SETTING COMPOSITION FOR COATING SUBSTRATES WITH AN ABRASION-RESISTANT TRANSPARENT OR TRANSLUCENT FILM

Nguyen van Tao, Cruseilles, France, and Günter Bellmann, Commugny, Switzerland, assignors to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 414,356, Aug. 27, 1982, abandoned. This application Mar. 1, 1985, Ser. No. 693,719

Claims priority, application Switzerland, Jan. 15, 1981, 240/81; PCT Int'l Appl., Jan. 11, 1982, PCT/EP82/00004

Int. Cl.[4] C08F *2/50*; B32B *27/16, 27/30, 27/36*

U.S. Cl. 522—37 **4 Claims**

1. A process for producing a UV-cured photopolymerizable composition for applying onto a substrate to provide thereon a transparent abrasion-resistance coating comprising:

hydrolyzing a trialkoxysilane in an aqueous acidic solution,

dispersing said hydrolyzed trialkoxysilane into intimate contact with finely divided pyrogenic or precipitated silica or alumina having a particle size of less than 0.1 micron to form a dispersion,

chemisorbing said hydrolyzed trialkoxysilane onto the finely divided pyrogenic or precipitated silica or alumina by effecting dehydration of said dispersion by heating to 80° to 110° C. to yield organophillic particles, the amount by weight of hydrolyzed trialkoxysilane chemisorbed onto

the silica or alumina being 20% or more relative the weight of the silica or alumina particles,

dispersing said organophillic particles into intimate contact with one or more photopolymerizable monomers and one or more photoinitiators.

4,624,972

GAMMA RADIATION RESISTANT CARBONATE POLYMER COMPOSITIONS

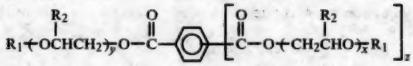
Vaughn M. Nace, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 25, 1985, Ser. No. 801,351

Int. Cl.[4] C08K 5/12; C08L 69/00

U.S. Cl. 523—136 **7 Claims**

1. A carbonate polymer composition with improved resistance to gamma radiation which comprises a carbonate polymer and a gamma radiation resistance improving amount of an ester of an aromatic acid having the formula



wherein R_1 is a phenyl radical or aliphatic hydrocarbon radical having one to eight carbon atoms; R_2 is either hydrogen or a methyl radical; x and y are independently 2, 3 or 4; z is 1, 2 or 3.

4,624,973

AQUEOUS COATING COMPOSITION

Teruaki Kuwajima, Higashiosaka; Keizou Ishii, Ashiya; Hiroshi Miwa, Itami, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 26, 1984, Ser. No. 634,865

Claims priority, application Japan, Jul. 26, 1983, 58-137290

The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.

Int. Cl.[4] C08L 33/02

U.S. Cl. 523—221 **8 Claims**

1. An aqueous coating composition comprising, as a resinous vehicle, at least one water soluble resin selected from the group consisting of a polyester resin, an alkyd resin, an acrylic resin, an acryl modified-polyester resin and an acryl modified-alkyd resin, and at least one water insoluble resin in particulate form obtained by the polymerization or copolymerization of α,β-ethylenically unsaturated monomer(s), which is characterized in that said water insoluble particulate resin is composed of mixture of (A) a group resinous particles having a mean grain diameter of $0.3\sim6\mu$ and (B) a group of resinous particles having a mean grain diameter of $0.01\sim0.1\mu$, in a weight ratio of (A)/(B)=99.9/0.1~40/60, and in that the solid weight ratio of said water soluble resin to the water insoluble resin particles is 99/1~15/85.

4,624,974

WATER-DISPERSIBLE BINDERS FOR CATIONIC ELECTRO-DIP PAINTS, AND METHOD FOR THEIR PRODUCTION

Michael Geist, Munster; Gunther Ott, Munster-Wolbeck, and Georg Schon, Everswinkel, all of Fed. Rep. of Germany, assignors to BASF Farben und Fasern Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,245

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331904

Int. Cl.[4] C08L 63/00; C09D 3/58, 5/46

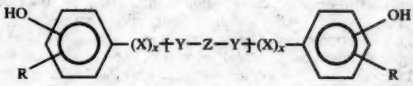
U.S. Cl. 523—414 **23 Claims**

1. A water-dispersible binder for cationic electro-dip paints, obtained by reaction of

(A) a low molecular weight epoxy resin, containing aromatic groups and having an epoxy equivalent weight under 375, with

(B) an aliphatic and/or alicyclic poly-functional alcohol and/or a carboxylic acid having a mean molecular weight under 350 to an epoxy group-containing intermediate product which contains a proportion of aromatic groups, calculated as phenylene group, of 10 to 45 percent by weight, and further modification of the resulting intermediate product with

(C) a compound having a molecular weight over 350 and being of the formula

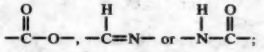


wherein

X is alkylene, arylene, alkarylene, O, O-alkylene, O-arylene, O-alkarylene, S, S-alkylene, S-arylene, S-alkarylene, —CO, CO-alkylene, CO-arylene, CO-alkarylene, $-SO_2-$, SO_2-alkylene, SO_2-arylene or SO_2-alkarylene;

x is 0 or 1;

Y is X,



Z is alkylene, polyester, polyether, polycarbonate or polyurethane;

R is H, CH_3, alkyl, —OH—CH_3, —O-alkyl, $-NO_2$, —NR'R" or —NHCOR'";

provided that

when X is O, NH or S, Y is other than O, O-alkylene, O-arylene, O-alkarylene, S, S-alkylene, S-arylene, S-alkarylene, —NHCO—, NH-alkylene, NH-arylene or NH-alkarylene;

when X is CO or SO_2, Y is other than CO, CO-alkylene, CO-arylene, CO-alkarylene, SO_2, SO_2-alkylene, SO_2-arylene, SO_2-alkarylene or CO_2—; to provide a second intermediate product and further reaction of the second intermediate product with

(D) a primary and/or secondary amine or ammonium salt to achieve the required dispersibility in water.

4,624,975

PROCESS FOR STABILIZING THE HYDROLYZABLE CHLORIDE CONTENT IN EPOXY RESINS

Ha Q. Pham, Richwood, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 714,290, Mar. 21, 1985, abandoned. This application Sep. 20, 1985, Ser. No. 778,587

Int. Cl.[4] C08G 59/06, 59/08

U.S. Cl. 523—453 **4 Claims**

1. In a process for preparing glycidyl ethers wherein (A) a composition containing one or more halohydrin ether groups is subjected to dehydrohalogenation with an alkali metal hydroxide or mixture thereof in the presence of one or more organic solvents, (B) washing the resultant composition with either water or a dilute aqueous solution of a weak inorganic acid or salt or a combination thereof; and (C) subjecting the organic phase from step (B) to distillation to remove the organic solvent(s); the improvement which comprises conducting step (C) in the presence of at least one sulfonic acid, sulfonic acid ester, organic sulfate or any combination thereof.

4,624,976

MODELING MATERIAL COMPOSITION

Osamu Amano, Yokohama; Atsushi Kaiya, Kawasaki; Takao Tanaka, Tokyo; Hitoshi Akimura, Ube; Katsuhiro Tsujihata, Ube, and Kouji Hirata, Ube, all of Japan, assignors to Nippon Petrochemicals Co., Ltd. and Ube Cycon, Ltd., both of Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,553
Claims priority, application Japan, Jul. 20, 1984, 59-149657
Int. Cl.[4] C08J 5/06; C08L 97/02; B22C 1/00
U.S. Cl. 524—13 11 Claims

1. A modeling material composition comprising a hydrocarbon oil having a viscosity of 10 to 500 cSt (100° F.) and an aromatic ring-forming carbon atom content (C_A) of 20 weight % or less, wood powder and an acrylonitrile-butadiene-styrene resin, said wood powder being present in an amount of 10 to 40 weight % based on the total amount of the wooden powder and the acrylonitrile-butadiene-styrene resin, said hydrocarbon oil being added in an amount to 10 to 50 weight parts per 100 weight parts of said wood powder, whose amounts described hereinabove are calculated in an air-dried state.

4,624,977

RUBBER COMPOSITION FOR USE IN A TIRE TREAD

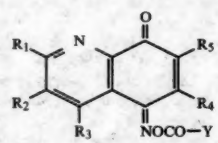
Michitaka Takeshita, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,004
Claims priority, application Japan, May 23, 1984, 59-102666
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—87 3 Claims

1. A rubber composition for use in a tire tread comprising:

(a) 100 parts by weight of a polyisoprene rubber selected from the group consisting of natural rubber and synthetic polyisoprene rubber,

(b) about 0.5 to about 5.0 parts by weight, based on weight converted to the equivalent weight of 5-nitroso-8-hydroxyquinoline, of a denatured nitrosoquinoline compound selected from the group consisting of compounds represented by the following general formula (I):



(I)

wherein R_1, R_2, R_3, R_4 and R_5 are each a hydrogen atom, a halogen atom, an amino group, an alkyl group, an alkoxy group or $—CH_2X$, where X is an amino group, a morpholino group, a hydroquinolino group or an aryl group, and Y is an alkyl group, an aryl group, a cycloalkyl group or $—NHR_6$, where R_6 is an alkyl group, an aryl group or a cycloalkyl group, and

(c) about 30 to about 90 parts by weight of carbon black having a nitrogen adsorption value (N_2SA) of about 65 to about 170 m^2/g and a dibutyl phthalate (DBP) adsorption value of about 80 to about 125 ml/100 g.

4,624,978

HIGH TEMPERATURE POLYIMIDE PROCESSING AID

Paul D. Frayer, Brooklyn, Conn., assignor to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 550,784, Nov. 14, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,480
Int. Cl.[4] C08K 5/34; C08L 79/08
U.S. Cl. 524—104 12 Claims

1. A melt processible composition comprising a polyimide and at least one compatible physical plasticizer, said Physical plasticizer comprising a N-alicyclic-pyrrolidone having a boiling point above the continuous use temperature limit for the polyimide wherein said compatible physical plasticizer is present in an amount sufficient to lower the glass transition temperature of said polyimide during processing of said polyimide.

2. The composition of claim 1 wherein said N-alicycli-pyrrolidone is N-cyclohexyl-2-pyrrolidone.

4,624,979

FLAME RETARDANT POLYPHENYLENE ETHER-POLYSTYRENE BLENDS OF INCREASED HEAT RESISTANCE AND METHOD OF ACHIEVEMENT

Robert J. Axelrod, Glenmont, N.Y., and Glenn D. Cooper, late of Delmar, N.Y. (by Rose H. Cooper, executrix), assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 28, 1984, Ser. No. 675,715
Int. Cl.[4] C08K 5/52
U.S. Cl. 524—140 25 Claims

1. A method for increasing the heat distortion temperature after molding of a flame retardant blend of a polyphenylene ether resin and a styrene polymer, comprising forming a compatible admixture of a polyphenylene ether resin and a flame retardant copolymer of styrene and dibromostyrene, said copolymer containing no more than 50 percent by weight of the dibromostyrene.

4,624,980

N-T-ALKYL-N-SEC-ALKYL SECONDARY AMINE COMPOUNDS

John W. Rekers, Spartanburg, and Edward W. Kluger, Pauline, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 646,303, Aug. 31, 1984, abandoned. This application Mar. 28, 1985, Ser. No. 717,049
Int. Cl.[4] C08K 5/17, 5/37; C08L 23/00
U.S. Cl. 524—238 9 Claims

1. A polymer composition stabilized against photodegradation by ultraviolet light which comprises a polyolefin polymer selected from polyethylene, polypropylene, polybutylene, and copolymers thereof and from about 0.05% to about 5% based upon the weight of the polymer of at least 1 stabilizer compound, said compound comprising: the reaction product of a cycloaliphatic epoxide and a t-alkyl primary amine compound, said epoxide having from 1 to about 4 epoxy groups and from 1 to about 5 cycloaliphatic groups each of which contains from about 5 to about 8 carbon atoms and said t-alkyl primary amine compound containing from 1 to about 2 amino groups and from about 4 to about 22 carbon atoms, in a ratio of epoxide to amine of approximately an equal molar ratio to an excess of amine compound on a molar basis in the presence of from about 1 to about 25 percent by weight based upon the weight based upon the weight of the epoxide present of a Lewis acid catalyst at a temperature of from about 60° C. to about 140° C.

4,624,981

PROCESS FOR THE PRODUCTION OF POLYAMIDEIMIDES FROM POLYISOCYANATES, POLYCARBOXYLIC ACID ANHYDRIDES AND LACTAMS OR POLYAMIDES IN WHICH THE REACTION PRODUCTS ARE PRECIPITATED WITH A NON-SOLVENT

Wilfried Zecher, Leverkusen; Rolf Dhein, Krefeld, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen

Continuation-in-part of Ser. No. 644,709, Aug. 27, 1984, Pat. No. 4,546,138. This application Jun. 20, 1985, Ser. No. 746,714
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332030
The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.
Int. Cl.[4] C08L 79/08
U.S. Cl. 524—326 8 Claims

1. A process for the production of polyamide imides by reacting polyisocyanates, polycarboxylic acid anhydrides and

lactams or polyamides in a solvent and subsequently working up the reaction product in the presence of from 0.2 to 15% by weight of a phenol which is mono- or poly-substituted with alkyl radicals having from 1 to 20 carbon atoms and/or with cycloalkyl radicals and/or with aryl radicals having from 6 to 12 carbon atoms, and when there are only alkyl substituents present, they must have in all at least 2 carbon atoms, whereupon the polyamide imides are precipitated with a non-solvent and then granulated.

4,624,982

METHOD OF TEMPORARILY INHIBITING THE SWELLABILITY OF WATER SWELLABLE CLAYS AND COMPOSITIONS

William Alexander, Naperville, Ill., assignor to American Colloid Company, Skokie, Ill.

Filed Apr. 5, 1985, Ser. No. 720,559

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—446 **17 Claims**

1. A method of temporarily inhibiting the swelling of a water-swellable clay in contact with water comprising mixing with said water-swellable clay and water an anionic polymer having a weight average molecular weight of about 2,000 to about 150,000 to reduce the viscosity of the clay mixture, and thereafter treating the polymer to return the water swelling characteristics to the clay and to reduce the weight average molecular weight of the polymer to less than 2000.

4,624,983

LIQUID COLORANT/ADDITIVE CONCENTRATE FOR PLASTICS

Richard E. Jarzombek, Munster, and Raymond J. Moeller, Cedar Lake, both of Ind., assignors to Bee Chemical Co., Lansing, Ill.

Continuation of Ser. No. 693,235, Jan. 22, 1985, Pat. No. 4,571,416, which is a continuation of Ser. No. 544,370, Oct. 21, 1983, abandoned. This application Jan. 13, 1986, Ser. No. 818,246

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—474 **21 Claims**

16. A liquid colorant dispersion for coloring plastic comprising from about 10 percent to about 90 percent of a colorant and from about 90 percent to about 10 percent of a vehicle, the vehicle comprising:

(a) from about 35 to about 65 percent by weight of a polybutene resin having an average molecular weight between about 1000 and 3500; and

(b) from about 35 to about 65 percent by weight of an essentially non-volatile solvent for the polybutene resin;

and wherein the dispersion has a viscosity of between about 1000 and 40,000 centipoises.

4,624,984

MOLDABLE COMPOSITION SUITABLE FOR THE PREPARATION OF VITREOUS CARBON

Louis L. Korb, and Phillip A. Waitkus, both of Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 583,418, Feb. 24, 1984, abandoned, which is a division of Ser. No. 502,181, Jun. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 356,893, Mar. 10, 1982, abandoned, which is a continuation of Ser. No. 182,755, Aug. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 50,531, Jun. 21, 1979, abandoned. This application Oct. 1, 1985, Ser. No. 782,313

Int. Cl.[4] C08K *3/04*; C08L *61/08, 61/10, 61/14*

U.S. Cl. 524—541 **31 Claims**

1. A moldable composition having improved mold flow properties prepared by the addition of phenolic-aldehyde Novolac resin in which at least 50 molar percent of said aldehyde is furfuraldehyde to an aqueous solution or suspension of a phenolic-aldehyde resol resin prior to the removal of 90 percent of the removable water from said resol resin solution or suspension, the proportions of said resins comprising 20–80 parts by weight of said Novolac resin and 20–80 parts by weight of said resol resin with the combined weight of said two resins comprising 100 parts by weight, thereafter effecting co-reaction of said resins together with an amine selected from the group consisting of hexamethylenetetramine and amines in which there is at least one hydrogen connected to a nitrogen atom, the amount of said amine being equivalent to 1–15 percent by weight of hexamethylenetetramine based on the total weight of phenolic component and removal of water from the resulting reaction mass while maintaining the resin in a moldable condition, the Novolac resin having been prepared with the removal of at least 25 percent by weight of the water removable during the Novolac preparation.

2. The composition of claim 1 in which said amine is hexamethylenetetramine.

4,624,985

PAPER COATING COMPOSITION COMPRISING PVA CONTAINING ACETOACETYL GROUP AND A PIGMENT

Shuji Tsutsumi, Kusatsu; Yoshirou Yamaguchi, Hirakata, and Satoru Kageyama, Ikeda, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 17, 1985, Ser. No. 809,903

Claims priority, application Japan, Dec. 21, 1984, 59-271505

Int. Cl.[4] C08L *29/04*; B41M *3/12*

U.S. Cl. 524—803 **3 Claims**

1. A paper coating composition comprising polyvinyl alcohol resin containing acetoacetyl group prepared by polymerizing vinyl acetate in the presence of a pigment having not more than pH 8 and then, hydrolysing the obtained polyvinyl acetate.

4,624,986

LOW TEMPERATURE IMPACT RESISTANT CARBONATE POLYMER BLENDS

Christian A. Weber, Sanford, and William P. Paige, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 487,477, Apr. 22, 1983, Pat. No. 4,526,926. This application Aug. 7, 1984, Ser. No. 638,433

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] C08L *51/04, 69/00*

U.S. Cl. 525—67 **7 Claims**

1. In a process for using carbonate polymer blends in a molded article which article is employed at less than about 0° F., the improvement which comprises employing as such a molded or extruded article exhibiting an impact strength at 0° F. of at least 50 percent of that impact strength of the article at 70° F., said article comprising a carbonate polymer blended with a functionally effective amount of a rubber-modified copolymer wherein said rubber-modified copolymer comprises from about 5 to about 25 weight percent rubber component, from about 50 to about 90 weight percent monovinylidene aromatic monomer, and from about 5 to about 25 weight percent monoethylenically unsaturated polar monomer, wherein said rubber-modified copolymer is a composition prepared using mass, bulk or mass suspension polymerization techniques and contains a random copolymer of a monovinylidene aromatic monomer and a polar comonomer and a rubber component grafted with a copolymer of the monovinylidene aromatic monomer and the polar comonomer, wherein the carbonate polymer is a homopolycarbonate of bisphenol-A.

4,624,987

VINYL CHLORIDE POLYMER COMPOSITION

Hideki Hosoi, Kobe; Toshihiko Hasegawa, Hyogo, and Hitoshi Hayashi, Kakogawa, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1985, Ser. No. 727,474
Claims priority, application Japan, May 8, 1984, 59-91240
Int. Cl.[4] C08L 27/06, 51/04
U.S. Cl. 525—84 11 Claims

1. A vinyl chloride polymer composition, capable of giving a molded article having excellent solvent-resistance, transparency and impact-resistance, comprising (A) 5 to 50% by weight of a MBS resin prepared by firstly graft polyerizing 15 to 40 parts by weight of monomer component comprising 80 to 100% by weight of methyl methacrylate and 20 to 0% by weight of one or more other vinyl monomers capable of copolymerizing with methyl methacrylate onto 40 to 70 parts by weight of a styrene-butadiene rubber including not more than 50% by weight of styrene, said styrene-butadiene rubber having an average particle size of not less than 1300 Å and a proportion of particles having a particle size of not more than 1000 Å being not more than 30% by weight and a proportion of particles having a particle size of not less than 3000 Å being not more than 10% by weight, and then, onto the obtained copolymer, secondarly graft-polymerizing 10 to 40 parts by weight of monomer component comprising 80 to 100% by weight of styrene and 20 to 0% by weight of one or other vinyl monomers capable of copolymerizing with styrene, a total amount of said styrene-butadiene rubber, the first graft-polymerizing monomer component and the second graft-polymerizing monomer component being 100 parts by weight, and (B) 95 to 50% by weight of vinyl chloride polymer; wherein

(i) an amount of said first graft-polymerizing monomer component including methyl methacrylate as a main component being 40 to 80% by weight based on the total weight of the first and second graft-polymerizing monomer components and

(ii) said MBS resin is prepared by graft-polymerizing under the condition that agglomeration of said styrene-butadiene rubber substantially does not occur in the course of graft-polymerization, and asid MBS resin has having an average particle size of not less than 1500 Å and a proportion of particles having a particle size of not more than 1000 Å being not more than 20% by weight and that having a particle size of not less than 3000 Å being not more than 20% by weight.

4,624,988

CURING OF THERMOPLASTIC TETRAFLUOROETHYLENE/PERFLUOROALKYL ETHYLENE COPOLYMERS

Scott J. Fritschel, Wilmington, Del., and William D. Saunders, Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 21, 1985, Ser. No. 789,758
Int. Cl.[4] C08F 14/26; C08J 3/24; C08K 5/13
U.S. Cl. 525—151 2 Claims

1. A process for crosslinking non-elastomeric, melt-fabricable fluorocarbon copolymers of tetrafluoroethylene and perfluoroalkyl ethylene which comprises treating the copolymer with the dipotassium salt of bis-phenol AF in an amount effective to cause crosslinking and heating the copolymer at 300°-340° C. for 4-30 minutes.

4,624,989

THERMOPLASTIC ELASTOMERS CONTAINING CROSS-LINKED EPIHALOHYDRIN RUBBERS

Dominic A. Berta, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 31, 1986, Ser. No. 824,499
Int. Cl.[4] C08L 23/04, 23/10, 23/28, 63/00
U.S. Cl. 525—187 11 Claims

1. A composition comprising a substantially homogenous blend of a cross-linked polyepihalohydrin rubber, a crystalline polyolefin that is a polymerized mixture of one or more olefins selected from the group consisting of ethylene, propylene, 1-butene, 1-pentene, 1-hexene, 2-methyl-1-propene, 3-methyl-1-pentene, 4-methyl-1-pentene, and 5-methyl-1-hexene, and a chlorinated hydrocarbon having a chlorine content of about 20% to about 70% by weight, wherein said hydrocarbon is a chlorinated paraffin, chlorinated polyethylene, or chlorinated polyisoprene.

4,624,990

MELT-SHAPEABLE FLUOROPOLYMER COMPOSITIONS

Haas E. Lunk, and Donald A. Reed, both of Menlo Park, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 539,871, Oct. 7, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 720,119
Int. Cl.[4] C08L 27/12
U.S. Cl. 525—199 13 Claims

1. A composition which can be melt-shaped and which comprises a mixture of

(1) a first fluoropolymer which has a crystallinity less than 45% and which can be melt-shaped in the absence of other polymers, and

(2) a second crystalline fluoropolymer which has a crystallinity of at least 50% and which has been obtained by irradiating a fluoropolymer which, prior to irradiation, could not be melt-extruded in the absence of other polymer.

4,624,991

COLD-STRETCHABLE, SELF-ADHESIVE FILM COMPOSITION

Armand Haas, Mazingarbe, France, assignor to Societe Chimique des Charbonnages-CdF Chimie, France

Continuation of Ser. No. 396,659, Jul. 9, 1982, abandoned. This application Jun. 21, 1985, Ser. No. 747,391
Claims priority, application France, Jul. 15, 1981, 81 13758
Int. Cl.[4] C08L 23/18, 23/22, 23/28, 23/12
U.S. Cl. 525—209 12 Claims

1. A cold-stretchable, self-adhesive film composition consisting essentially of:

(a) from 88 to 97% by weight of an ethylene-α-olefin copolymer, the distribution of said α-oleofin units in the copolymer being heterogeneous, said α-olefin having from 3 to 10 carbon atoms and said copolymer having a density of between 0.905 and 0.940 g/cm^3 and a melt index of between 0.1 and 2 dg/min and;

(b) from 3 to 12% by weight of a polymer selected from the group consisting of polyisobutylene, atactic polypropylene, cis-polybutadiene and bromobutyl rubber;

wherein film produced from said composition exhibits an adhesive force of at least about 65 grams as determined by standard specification ASTM 3354-74.

4,624,992

PROCESS FOR GRAFTING UNSATURATED MONOMERS ON OLEFINIC POLYMERS

Federico Milani, S. Maria Maddalena, and Marco Binaghi, Milan, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Jan. 6, 1986, Ser. No. 816,445
Claims priority, application Italy, Jan. 8, 1985, 19049 A/85
Int. Cl.[4] C08F 255/02, 255/04, 255/06
U.S. Cl. 525—257 2 Claims

1. Process for the grafting of ethylenically unsaturated monomers on olefine homopolymers or copolymers by means of a radical initiator reaction, characterized in that the reaction is achieved at temperatures comprised between 60° and 160° C., maintaining the olefinic polymer dissolved in a solvent consisting essentially of a homogeneous solution a component (A) chosen from the group consisting of aliphatic and aromatic

hydrocarbons, ethers and esters containing at least one aromatic or cycloaliphatic group, and a component (B) consisting of either an aliphatic, cycloaliphatic or aromatic ketone, and in that the polymer thus grafted is separated from the solution by cooling down said solution to a temperature below 40° C., said solution of (A) and (B) being a non-solvent for the grafted polymer at a temperature below 40° C.

4,624,993

METHOD FOR DEPOLYMERIZING POLYMERS

Janardan D. Upadhyaya, Fairfield, Conn., assignor to Moore and Munger, Inc., Fairfield, Conn.

Filed Feb. 8, 1985, Ser. No. 699,658
Int. Cl.[4] C08F *8/50*
U.S. Cl. 525—388 10 Claims

1. A method for depolymerizing a meltable, organic polymer wherein said polymer is selected from the group consisting of polyolefins, Fischer-Tropsch waxes, petroleum waxes, and mixtures thereof, comprising the steps of heating the polymer until it is molten and then reacting the molten polymer with oxygen in the absence of a catalyst at a temperature between about 270° F. and about 415° F. by sparging the molten material at a flow rate of at least 2 cubic feet per minute per 1000 pounds of polymer with oxygen-containing gas bubbles having a diameter of less than about 10.0 mm.

4,624,994

SOFT AND TOUGH RADIATION-CURABLE COATINGS FOR FIBER OPTIC APPLICATION

Robert E. Ansel, Hoffman Estates, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 18, 1980, Ser. No. 170,148
Int. Cl.[4] C08F *20/18*
U.S. Cl. 525—440 18 Claims

1. A radiation-curable liquid coating composition which cures on radiation exposure to form a soft and tough coating comprising, a polyurethane, polyamide or polyurea oligomer having (1) a molecular weight in the range of about 2000 to about 8000; (2) amide, urea or urethane groups in an amount of one such group for every 300 to 900 units of weight, and (3) polyalkylene polyether, polyalkylene polysulfide or polyalkylene polyester groups in which the alkylene moiety contains from 2–6 carbon atoms, said polyether, polysulfide or polyester constituting from about 40% to about 90% by weight of said oligomer, each end of said oligomer being terminated with a monoethylenically unsaturated addition polymerizable group, from 20% to 50%, based on the total weight of the composition, of a radiation-curable monoethylenically unsaturated monomer having a T_g below about 10° C., and from about 2% to about 20%, based on the total weight of the composition, of a monoethylenically unsaturated monomer having a strong capacity for hydrogen bonding.

4,624,995

TRIAZOLINETHIONE-CONTAINING POLYMER

Alan R. Katritzky; Stephen J. Cato, both of Gainesville, Fla.; Jerald K. Rasmussen, Stillwater, Minn.; Larry R. Krepski, White Bear Lake, Minn., and Steven M. Heilmann, N. St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 9, 1985, Ser. No. 721,317
Int. Cl.[4] C08G *73/08*
U.S. Cl. 525—452 10 Claims

1. A poly(triazolinethione) prepared by a process comprising the steps:

(a) providing a poly(acylthiosemicarbazide),

(b) cyclodehydrating said poly(acylthiosemicarbazide) by subjecting it to an elevated temperature of 60° to 150° C. in the presence of an aqueous alkaline solution to form a polyanion of a poly(triazolinethione),

(c) treating said polyanion of said poly(triazolinethione) with aqueous acid solution to provide said poly(-triazolinethione), and

(d) isolating said resulting poly(triazolinethione);

said poly(triazolinethione) being uncrosslinked, and at least 0.1 weight percent of said poly(triazolinethione) being capable of dissolving in dimethylformamide, dimethylacetamide, dimethyl sulfoxide, or N-methylpyrrolidone at 23° C.

4,624,996

HEAT CURABLE ONE PACKAGE POLYURETHANE RESIN COMPOSITION

Sidky D. Rizk, Westfield, and Harry W. S. Hsieh, Edison, both of N.J., assignors to Essex Specialty Products, Inc., Sayreville, N.J.

Continuation of Ser. No. 580,886, Feb. 16, 1984, abandoned. This application May 29, 1985, Ser. No. 738,898
Int. Cl.[4] C08F *283/04*
U.S. Cl. 525—453 12 Claims

1. A one-package solventless polyurethane resin sealant composition curable to a Short "A" hardness of at least 60–65 by heating at 250° F. for about 30 minutes, or at higher temperatures for shorter times, said composition comprising

(1) a polyurethane polymer having terminal isocyanate groups, all of which are blocked by reaction with an oxime, said prepolymer being prepared by reacting a composition consisting essentially of an excess of an aliphatic, cycloaliphatic, araliphatic, or aromatic polyisocyanate and at least one polyol reagent selected from the group consisting of polyether polyols and polyester polyols to give an isocyanate terminated prepolymer having a molecular weight between about 3,000 and 6,000 and then blocking the isocyanate groups thereof by reaction with an oxime;

(2) a stoichiometric amount of a polyol curing agent having at least two active hydrogen atoms per molecule; and

(3) at least one filler suitable for use in elastomeric compositions.

4,624,997

ARTICLE MOLDED FROM A BLEND OF A POLY(ARYL ETHER KETONE) AND A POLY(ARYL ETHER SULFONE)

Lloyd M. Robeson, Whitehouse Station, and James E. Harris, Piscataway, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 28, 1984, Ser. No. 655,584
Int. Cl.[4] C08F *283/00*
U.S. Cl. 525—471 25 Claims

1. An article molded from a blend of from about 5 to about 95 weight percent of a crystalline poly(aryl ether ketone) and from about 95 to about 5 weight percent of an amorphous poly(aryl ether sulfone) containing recurring units of the following formula:

—O—E—O—E'—

wherein E is the residuum of a dihydric phenol, and E' is the residuum of a benzenoid compound having an inert electron withdrawing group in at least one of the positions ortho and para to the valence bonds; both of said residua are valently bonded to the ether oxygens through aromatic carbon atoms; said poly(aryl ether ketone) having a reduced viscosity of at least about 0.4 to about 5.0 dl/g as measured in concentrated sulphuric acid at 25° C. and said poly(aryl ether sulfone) having a reduced viscosity of from about 0.4 to greater than 2.5 as measured in N-methylpyrolidone at 25° C.

4,624,998

SILICONE-MODIFIED EPOXY RESINS HAVING IMPROVED IMPACT RESISTANCE

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 30, 1985, Ser. No. 814,462
Int. Cl.[4] C08F *283/00*
U.S. Cl. 525—476 **20 Claims**

1. A dispersion comprising:

a. from about 78 to 94.5 percent by weight of a curable epoxy resin;

b. from about 5 to 20 percent by weight of an alpha,omega-functional polydimethylsiloxane having an average degree of polymerization between 30 and 400 and having endblocking groups containing carboxyl, amine or epoxide functionality; and

c. from about 0.5 to 2.0 percent by weight of a dispersing agent capable of maintaining (b) dispersed in (a), said dispersing agent being a siloxane copolymer selected from the group consisting of

1. copolymers consisting essentially of SiO_2 units, $(CH_3)_3SiO_{\frac{1}{2}}$units and $D(CH_3)_2SiO_{\frac{1}{2}}$units in which D is a polyoxyethylene polymer having a molecular weight between 1000 and 5000, or a polyoxyethylene-polyoxypropylene copolymer having a molecular weight between 1000 and 6000 wherein the polyoxypropylene portion constitutes up to 100 mole percent of the copolymer, said D being attached to the silicon atom via a silicon-carbon bond, and the ratio of the SiO_2 units to the total $(CH_3)_3SiO_{\frac{1}{2}}$and $D(CH_3)_2SiO_{\frac{1}{2}}$units is in the range of 1:0.4 to 1:1.2,

2. copolymers which are reaction products derived from heating a mixture of a siloxane resin copolymer consisting essentially of SiO_2 units and $(CH_3)_3SiO_{\frac{1}{2}}$units in which the ratio of SiO_2 units to $(CH_3)_3SiO_{\frac{1}{2}}$units is in the range of 1:0.4 to 1:1.2, and a hydroxylated polyoxyethylene polymer having a molecular weight in the range of 1000 to 5000 or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight in the range of 1000 to 6000 wherein the polyoxypropylene portion constitutes up to 100 mole percent of the copolymer,

3. polydimethylsiloxane-organic copolymer in which the polydimethylsiloxane portion has a molecular weight between 1500 and 2000 and the organic portion consists essentially of a polyoxyethylene polymer having a molecular weight between 1000 and 2000, or a polyoxyethylene-polyoxypropylene copolymer having a molecular weight between 1500 and 4000 wherein said polyoxypropylene portion constitutes up to 100 mole percent of organic portion of the copolymer, said organic portion being attached to silicon atoms via silicon-carbon bonds, and

4. polydimethylsiloxane-organic copolymers which are the reaction products produced by heating a mixture of a polydimethylsiloxane containing silicon bonded hydrogen atoms having a molecular weight between 1500 and 2000 and a hydroxylated polyoxyethylene having a molecular weight between 1000 and 2000, or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight between 1500 and 4000 wherein said polyoxypropylene constitutes up to 100 mole percent of the organic portion of the copolymer.

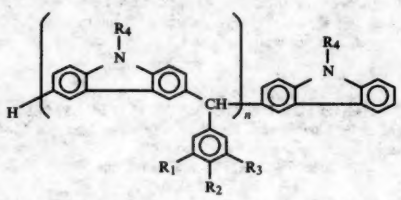
4,624,999

ELECTRICALLY CONDUCTING COMPLEXES OF POLYMERS OF N-SUBSTITUTED CARBAZOLES AND SUBSTITUTED BENZALDEHYDES

Samson A. Jenekhe, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 29, 1985, Ser. No. 760,027
Int. Cl.[4] C08F *283/00*; C08G *2/00*
U.S. Cl. 525—509 **23 Claims**

1. A polymer comprising species selected from the group consisting of carbazole and N-substituted carbazoles and species selected from the group consisting of benzaldehyde and substituted benzaldehyes having the following structure:



wherein

R_1 is selected from H, CH_3, F, Cl and Br

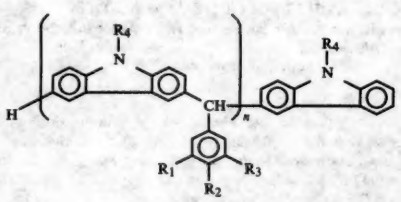
R_2 is selected from H, CH_3 F, Cl, Br, OH, No_2, —OCH_3 and —S—CH_3

R_3 is selected from H, CH_3, F, Cl, and Br

R_4 is selected from H, CH_3, C_2H_5, and $Si(CH_3)_3$

n is an integer between 2 and 500.

14. An electrically conducting polymer complex comprising species selected from the group consisting of carbazole and N-substituted carbazoles and species selected from the group consisting of benzaldehyde and substituted benzaldehydes having the following structure:



wherein

R_1 is selected from H, CH_3, F, Cl and Br,

R_2 is selected from H, CH_3, F, Cl, Br, OH, NO_2, —OCH_3, and —S—CH_3,

R_3 is selected from H, CH_3, F, Cl and Br,

R_4 is selected from H, CH_3, C_2H_5, and

n is an integer between 2 and 500

doped with a compatible charge transfer acceptor selected from the group of sources or dopant counter ions consisting of I_2, Br_2, Cl_2, HI, HBr, HCl, SO_3, ClO_4^-, HSO_4^-, FSO_3^-, $SO_3CF_3^-$, $COOCF_3^-$, $C_6H_2(NO_2)SO_3^-$ and $CrC_6H_4SO_3^-$, AsF_6^-, SbF_6^-, BF_4^- and FCl_4^- or a combination thereof.

4,625,000

PROCESS FOR PREPARING SULFONATED POLY(ARYL ETHER) RESINS

Herbert S. Chao, Watervliet, N.Y., and Donald R. Kelsey, Hillsborough, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 12, 1985, Ser. No. 743,972
Int. Cl.[4] C08F *283/00*; C08G *8/28*
U.S. Cl. 525—534 **67 Claims**

1. A method of making a silyl sulfonate derivative of a poly(aryl ether) resin, comprising reacting

a linear poly(aryl ether) resin, comprised of repeat units of the formula

—O—E—O—E′—

where E is the residuum of a dihydric phenol and E′ is the residuum of a benzenoid compound having an electron

withdrawing group in at least one of the positions ortho and para to the valence bonds, wherein both of said residua E and E' are bonded to ether oxygens through aromatic carbon atoms

with an effective amount of a silyl halosulfonate and under reaction conditions sufficient to form said derivative.

4,625,001

METHOD FOR CONTINUOUS PRODUCTION OF CROSS-LINKED POLYMER

Tsuneo Tsubakimoto; Tadao Shimomura, both of Osaka, and Yoshio Irie, Hyogo, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 647,971, Sep. 25, 1984, abandoned. This application Oct. 24, 1985, Ser. No. 790,819

Int. Cl.[4] C08F *2/10*

U.S. Cl. 526—88 **13 Claims**

1. A method for the continuous production of a cross-linked polymer having a content of particles greater than 3 centimeters in diameter not exceeding 2% by weight of the particles produced, comprising the steps of continuously feeding the aqueous solution of a monomer capable of being converted by aqueous solution polymerization into a water-containing cross-linked gel polymer and a polymerization initiator to a vessel provided with a plurality of mutually parallel rotary stirring shafts each fitted with stirring blades, finely dividing a water-containing gel polymer issuing from the polymerization in progress by the shearing force of stirring blades generated by the rotation of said stirring shafts while allowing the radical aqueous solution polymerization to proceed without interruption, and continuously discharging the resultant finely divided water-containing gel polymer out of said vessel.

4,625,002

BINUCLEAR CATALYST FOR THE PREPARATION OF POLYAMIDE

Raymond J. Weinert, Jr., Garfield Heights; Kenneth C. Benton, Macedonia; Michael J. Desmond, Cleveland Heights; Lawrence E. Ball, Cuyahoga Falls, and Barbara D. Curatolo, Maple Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 3, 1983, Ser. No. 455,149

Int. Cl.[4] C08F *4/00*; C08G *69/00, 69/16, 69/28*

U.S. Cl. 526—90 **27 Claims**

1. A process for producing a nylon polyamide comprising contacting, at a temperature sufficient to cause polymerization, a polyamide forming system with a transition metal complex catalyst; the catalyst comprising at least one binucleating ligand attached to at least one transition metal containing nucleus.

4,625,003

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS (P-1026)

Masafumi Imai; Tadashi Yamamoto; Hiroyuki Furuhashi; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 642,022, Aug. 20, 1984, Pat. No. 4,552,858. This application Aug. 30, 1985, Ser. No. 771,392

Claims priority, application Japan, Aug. 30, 1985, 60-157092

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—119 **9 Claims**

1. A process for the polymerization of olefins which comprises homopolymerizing ethylene or an alpha-olefin or copolymerizing an alpha-olefin with another alpha-olefin or with ethylene in the presence of a catalyst system comprising

(A) a titanium halide containing catalyst component for the polymerization of olefins obtained by (1) reacting (a) $Mg(OR)(OR')$ with (b) a silicon compound having at least one silicon-hydrogen bond, (2) contacting the reaction product with (c) an electron donor compound, (3) contacting the resulting contact product two or more times with a titanium halide, and (4) between at least one of the multiple titanium halide contacts, contacting the titanium halide contacted solid with a halide of an element selected from the group consisting of elements of Groups IIIa, IVa, and Va of the Periodic Table, wherein R and R' are radicals selected from alkyl, alkenyl, cycloalkyl, aryl and aralkyl radicals and R and R' may be the same or different

(B) and an organoaluminum cocatalyst.

4,625,004

FLAME-RETARDANT MOLDED COMPOSITION WHICH INCORPORATES A POLY (STYRENE-CO-N-PHENYLMALEIMIDE-CO-DIBROMOSTYRENE COPOLYMER

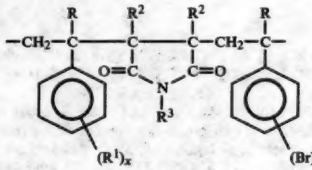
Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 685,362, Dec. 24, 1984. This application Apr. 11, 1986, Ser. No. 850,809

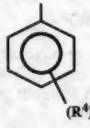
Int. Cl.[4] C08F *214/16*; C08L *39/04*

U.S. Cl. 526—262 **5 Claims**

1. A random copolymer comprised of the following recurring units:



wherein each R separately represents —H, $—CH_3$, or $—CH_2CH_3$; R^1 represents $—CH_3$, $—CH_2CH_3$, $—CH(CH_3)_2$, $—C(CH_3)_3$, —OH, $—NH_2$, $—OCH_3$, $—CO_2H$, $—CONH_2$, or $—CON(CH_3)_2$; each R^2 separately represents —H or $—CH_3$; R^3 represents a C_1 to C_4 alkyl group, a chlorine or bromine substituted C_1 to C_4 alkyl group, or



R^4 represents $—CH_3$, $—CH_2CH_3$, $—CH(CH_3)_2$, $—C(CH_3)_3$, —Cl, —Br, —OH, $—NH_2$, $—OCH_3$, $—CO_2H$, $—CONH_2$, or $—CON(CH_3)_2$; x represents an integer of from 0 to 3; and, wherein y represents an integer of from 1 to 3.

4,625,005

MULTI-COMPONENT COPOLYMER RUBBER, A PROCESS FOR PRODUCING THE SAME, AND A RUBBER COMPOSITION CONTAINING THE MULTI-COMPONENT COPOLYMER RUBBER

Toshio Miyabayashi; Nobuyuki Sakabe; Yoshiyuki Udagawa, all of Yokkaichi; Hiroji Enyo, Suzuka, and Yasuhiko Takemura, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,350

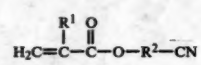
Claims priority, application Japan, Mar. 28, 1984, 59-60351; Mar. 28, 1984, 59-60352; Mar. 28, 1984, 59-60353; Mar. 29, 1984, 59-61757; Mar. 29, 1984, 59-61758; Mar. 31, 1984, 59-64132; Mar. 31, 1984, 59-64133; Apr. 6, 1984, 59-68678; Apr. 14, 1984, 59-75583; Aug. 10, 1984, 59-167544; Nov. 19, 1984, 59-244127

Int. Cl.[4] C08F *20/34*

U.S. Cl. 526—273 5 Claims

1. A multi-component copolymer rubber, consisting essentially of:

(A) 20 to 69.5% by weight of a cyano-substituted alkyl(methy)acrylate of the formula



wherein R^1 is hydrogen or methyl and R^2CN is a cyanoalkyl group of 2 to 12 carbon atoms,

(B) 30 to 79.5% by weight of an alkyl acrylate,

(C) 0.5 to 10% by weight of an epoxy group-containing, ethylenically unsaturated compound as a crosslinkable monomer, and

(D) 0 to 10% by weight of another ethylenically unsaturated monomer copolymerizable with components (A), (B) and (C).

4,625,006

ADHESIVIZING AGENT COPOLYMERS CONTAINING BOTH ACRYLATE OR METHACRYLATE GROUPS AND ALKOXYSILYL GROUPS

Günther Bernhardt, St. Augustin, and Horst Hanisch, Hennef, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

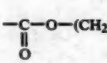
Continuation of Ser. No. 516,258, Jul. 22, 1983, abandoned. This application Nov. 6, 1984, Ser. No. 668,697

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 3227552

Int. Cl.[4] C08F *230/08, 218/60*

U.S. Cl. 526—279 8 Claims

1. A copolymer formed by polymerizing at least two different ethylenically unsaturated constituents, each of said constituents having two chain carbon atoms wherein a first of said ethylenically unsaturated constituents is linked with a carboxylic acid moiety through an oxygen atom of said acid moiety, said acid moiety having an α-position carbon atom which is substituted with an acrylic or methacrylic acid moiety; and a second of said constituents having an alkoxysilyl moiety linked to one of the chain carbon atoms of said second constitutent directly or through a group



4,625,007

SILICONE-CONTAINING CONTACT LENS MATERIAL AND CONTACT LENSES MADE THEREOF

Edward J. Ellis, and Jeanne Y. Ellis, both of Georgetown, Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

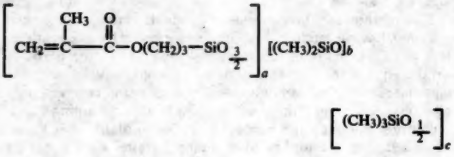
Continuation of Ser. No. 580,478, Feb. 15, 1984, abandoned, which is a continuation of Ser. No. 430,489, Sep. 30, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 692,904

Int. Cl.[4] C08F *30/08*

U.S. Cl. 526—279 5 Claims

1. A contact lens consisting essentially of polymerized material formed from

(A) 25 to 98% by weight of the resin system having the following formula:



a=0.10 to 0.40 mole fraction

b=0.25 to 0.80 mole fraction

c=0.10 to 0.40 mole fraction,

(B) 75 to 2% by weight of an ester of a C_1–C_{20} monohydric or polyhydric alkanol or phenol and an acid selected fom the class consisting essentially of acrylic, methacrylic, itaconic acid and mixtures thereof, and

(C) 1 to 10% of a hydrophilic agent,

which material is polymerized to a degree above 95% completion by free radical polymerization.

4,625,008

ADHESIVES WHICH CONTAIN ACRYLIC ACID DERIVATIVES OF 5,6-DIHYDRO-DICYCLOPENTADIENOL

Wolfgang Fischer, Meerbusch, and Wilfried Kniege, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

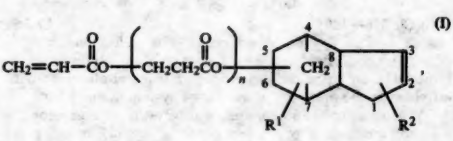
Filed Mar. 24, 1986, Ser. No. 842,900

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512625

Int. Cl.[4] C08F *20/28*

U.S. Cl. 526—283 4 Claims

1. One-component and two-component adhesives which contain compounds of the formula (I)



(I)

wherein

R^1 and R^2 independently from each other represent a hydrogen atom, a C_1–C_4-alkyl group,

n represents an integer of from 1 to 5.

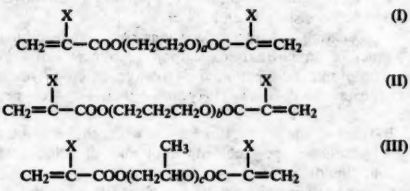
4,625,009

HIGH-HYDRATION CONTACT LENS

Tetsuro Izumitani; Niro Tarumi; Shigeo Komiya, and Takeyuki Sawamoto, all of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 845,936
Claims priority, application Japan, Mar. 30, 1985, 60-65015
Int. Cl.[4] C08F 20/54
U.S. Cl. 526—307.5 5 Claims

1. A high-hydration contact lens with a water content of 60% or more which is made of a copolymer composed of (i) 40 to 90 wt% of N,N-dimethyl acrylamide, (ii) 5 to 50 wt% of a hydrophobic monomer, (iii) 0.1 to 10 wt% of an unsaturated carboxylic acid having one ethylenically unsaturated bond, and (iv) 0.01 to 5.0 wt% of a crosslinking agent, wherein the hydrophobic monomer is selected from the group consisting of phenyl acrylates, benzyl acrylates, phenyl methacrylates, benzyl methacrylates, alkyl acrylates, alkyl methacrylates, cyclohexyl acrylates and cyclohexyl methacrylates, and the crosslinking agent is selected from those represented by formula (I), (II), or (III)



wherein X represents a hydrogen atom or a methyl group, a is an integer of 2 to 23, and b and c each is an integer of 2 to 14.

4,625,010

ORGANOPOLYSILOXANES HAVING SI-BONDED HYDROGEN AND SIC-BONDED EPOXY GROUPS AND A PROCESS FOR PREPARING THE SAME

Karl Huhn, and Rudolf Kaufmann, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 9, 1985, Ser. No. 763,865
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1984, 3431075
Int. Cl.[4] C08G 77/12
U.S. Cl. 528—31 7 Claims

1. Organopolysiloxanes terminated by units of the formula $R_3SiO_{\frac{1}{2}}$ and comprising

20 to 90 mole percent of units of the formula RR^1SiO,
3 to 30 mole percent of units of the formula RR^2SiO,
3 to 30 mole percent of units of the formula RR^3SiO,
3 to 60 mole percent of units of the formula $RHSiO$, and
0 to 60 mole percent of units of the formula R_2SiO,

where R is selected from the group consisting of alkyl radicals having from 1 to 4 carbon atoms per radical and a phenyl radical, R^1 is an alkyl radical having at least 6 carbon atoms per radical, R^2 is selected from the group consisting of aralkyl radicals and alkylated aralkyl radicals and R^3 is an SiC-bonded monovalent organic radical having in each case at least one vicinal epoxy group per radical, in which the sum of the percentages adds up to 100 mole percent.

4,625,011

NEUTRALIZATION OF ALKALI METAL CATALYSTS IN ORGANOPOLYSILOXANES

Diane M. Kosal, and Myron T. Maxson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 504,635, Jun. 15, 1983, abandoned. This application Sep. 8, 1983, Ser. No. 530,296
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—14 43 Claims

1. A process for neutralizing an alkali metal catalyst in an alkali metal catalyst polymerized organopolysiloxane, where said polymerized organopolysiloxane has a viscosity of 10 to 500,000 centipoises at 25° C., which process comprises (1) intimately contacting said polymerized organopolysiloxane with an effective amount of an organic carboxylic acid of general formula ZCOOH where Z is a hydrocarbon group containing at least two carbon atoms and where said organic carboxylic acid is selected from the group consisting of straight-chain organic carboxylic acids and cyclohexane carboxylic acid, and (2) filtering the product of step (1) in order to reduce the alkali metal content of said polymerized organopolysiloxane.

4,625,012

MOISTURE CURABLE POLYURETHANE POLYMERS

Sidky D. Rizk, Westfield, and Harry W. S. Hsieh, Rahway, both of N.J., assignors to Essex Specialty Products, Inc., Sayreville, N.J.

Filed Aug. 26, 1985, Ser. No. 769,409
Int. Cl.[4] C08G 77/04
U.S. Cl. 528—28 18 Claims

1. A method for making a moisture curable polyurethane polymer having terminal isocyanate groups and pendant silane groups having at least one hydrolyzable alkoxy group bonded to silicon, which method comprises reacting

(1) an isocyanatosilane adduct having at least two isocyanato groups and
(2) an isocyanate different from (1) and having at least two isocyanato groups with
(3) a polyol,

said isocyanatosilane adduct being the reaction product of an isocyanate having at least three isocyanato groups with an organofunctional alkoxysilane.

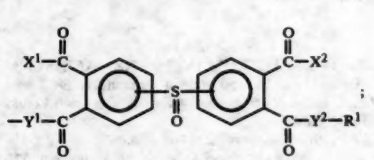
4,625,013

AROMATIC SULFOXY COMPOSITIONS AND METHOD FOR THEIR PREPARATION

Thomas L. Evans, and Marsha M. Grade, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,392
Int. Cl.[4] C08G 73/10, 75/30
U.S. Cl. 528—172 6 Claims

1. A polymer comprising structural units of the formula



wherein:

X^1 and X^2 are both OH and Y^1 and Y^2 are both NH, or X^1 and Y^1 together are N and X^2 and Y^2 together and

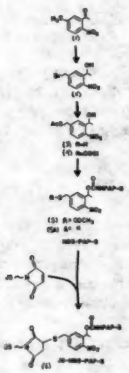
and

R^1 is an aromatic hydrocarbon radical containing about 6–20 carbon atoms or a halogenated derivative thereof, an alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or a bisalkylenepoly(dialkylsiloxane) radical.

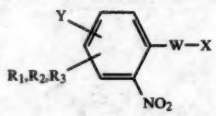
4,625,014
CELL-DELIVERY AGENT

Peter D. Senter, Jamaica Plain; John M. Lambert, and Walter A. Blattler, both of Brookline, all of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Filed Jul. 10, 1984, Ser. No. 629,363
Int. Cl.[4] C07K 7/00; A61K 37/02
U.S. Cl. 530—300 28 Claims



1. A photocleavable compound having the formula,



where W comprises an oxycarbonyl function, an aminocarbonyl function, or a phosphate function; one of X and Y comprises a peptide; the other of X and Y comprises a cell-surface binding partner that is either an antibody to a cell-surface antigen or a binding partner for a cell-surface receptor; and each of R_1, R_2, and R_3 is independently selected from —H, a lower alkyl group, a lower alkoxy group, or a cyclic alkyl or aryl group.

4,625,015
BROAD SPECTRUM INFLUENZA ANTISERA

Nicola Green, La Jolla, and Stephen Alexander, San Diego, both of Calif., assignors to Scripps Clinic & Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 410,455, Aug. 23, 1982, abandoned. This application Aug. 29, 1983, Ser. No. 527,401
Int. Cl.[4] C07K 7/06, 7/10, 17/02; A61K 39/145
U.S. Cl. 530—324 9 Claims

1. A peptide having an amino acid residue sequence that corresponds to the sequence, form left to right and in the direction of amino-terminus to carboxy-terminus, of the formula.

SIMRSDAPIGTCSSECITPNGSIPNDKPFQNV-NKITY.

7. A receptor molecule raised to a peptide having an amino acid residue sequence that corresponds to the sequence, from left to right and in the direction of amino-terminus to carboxy-terminus, of the formula

SIMRSDAPIGTCSSECITPNGSIPNDKPFQNV-NKITY.

4,625,016
COLLAGEN INHIBITING COMPOSITIONS AND PROCESSES FOR MANUFACTURING AND USING SAME

Darwin J. Prockop, Princeton, N.J., assignor to University of Medicine and Dentistry of New Jersey, Newark, N.J.

Division of Ser. No. 311,290, Oct. 16, 1981, Pat. No. 4,428,939. This application Oct. 17, 1983, Ser. No. 542,382
Int. Cl.[4] C07K 1/02
U.S. Cl. 530—338 3 Claims

1. A method for the synthesis of a polymer of cis-4-hydroxy-L-proline consisting essentially of:

A. preparing an active diester comprising the reaction product of an N-Benzyloxycarbonyl-, t-butyl and O-pentachlorophenyl-substituted derivative of cis-4-hydroxy-L-proline, and N-benzyloxycarbonyl-cis-4-hydroxyproline-OH;

B. reacting the product of Step A with ethyl acetate, tetrahydrofuran, pentachlorophenol and dicyclohexyldicarbodiimide;

C. polymerizing the product of Step B by dissolving it in dimethylformamide, triethylamine and imidazole; and

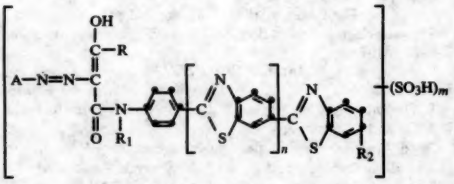
D. recovering the polymeric reaction product by catalytic hydrogenation of the product of Step C.

4,625,017
METAL COMPLEXES OF AZO DYES CONTAINING A 2-(P-N-ACELOACETYLAMINOPHENYL) BENZOTHIOZOLE MOIETY

Alois Püntener, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 12, 1982, Ser. No. 441,125
Claims priority, application Switzerland, Nov. 16, 1981, 7353/81
Int. Cl.[4] C09B 29/33, 45/00, 45/16, 45/20
U.S. Cl. 534—695 8 Claims

1. A heavy metal complex dye containing one dye of the formula



wherein

A is the radical of a diazo compound of a benzene or naphthalene, which diazo compound contains in the o-position with respect to the azo group a metallizable hydroxyl group, wherein the radical A is unsubstituted or substituted by low-molecular alkyl, low-molecular alkoxy, chlorine, bromine, nitro, cyano, sulfo, alkysulfonyl, sulfamoyl, methyl sulfamoyl, low-molecular alkanoylamino, low-molecular alkylsulfonylamino, low-molecular alkoxycarbonylamino, sulfonylamino, aroylamino, arylsul-

fonylamino, azobenzene or azonaphthalene, and the aryl groups of the azobenzene and the azonaphthalene are unsubstituted or substituted with any substituent listed above for A,

R is methyl, chloromethyl, phenyl C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl or halophenyl,

R_1 is hydrogen or C_1–C_4-alkyl,

R_2 is hydrogen or methyl,

n is 0 or 1, and

m is 0, 1, 2 or 3.

4,625,018

AZO PIGMENT COMPOSITION CONTAINING A LAKED AZO PIGMENT AND FORTIFIED LATEX

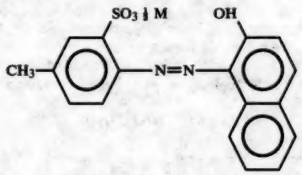
Byron G. Hays, Verona, N.J., assignor to Inmont Corporation, Clifton, N.J.

Continuation of Ser. No. 513,685, Jul. 14, 1983, abandoned. This application Aug. 26, 1985, Ser. No. 768,937

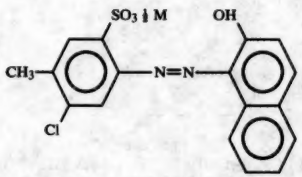
Int. Cl.[4] C09B *29/15, 45/22;* D06P *1/44, 1/52*

U.S. Cl. 534—724 **11 Claims**

1. An azo pigment composition comprising: about 72.0 wt. percent to about 99.0 wt. percent of a laked azo pigment selected from the group consisting of:



and



wherein M is a cation selected from the group consisting of barium, calcium, magnesium, and manganese; about 1.0 wt. percent to about 20.0 wt. percent of a fortified latex characterized by the presence of distinct dispersed and soluble polymer phases.

4,625,019

POLYMERIC PRODUCT OF DAUNORUBICIN AND GLUTARALDEHYDE

Edgar H. Relyveld, Paris, France, assignor to Institut Pasteur, Paris, France

PCT No. PCT/FR83/00036, § 371 Date Oct. 26, 1983, § 102(e) Date Oct. 26, 1983, PCT Pub. No. WO83/02946, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 25, 1983, Ser. No. 552,148

Claims priority, application France, Feb. 26, 1982, 82 03272

Int. Cl.[4] C07H *15/24*

U.S. Cl. 536—6.4 **1 Claim**

1. Autopolymerized antitumor agent, comprising the product of the reaction of an active antitumor agent which is daunorubicin or a pharmaceutically acceptable acid addition salt thereof, with an autopolymerizing-effective amount of glutaraldehyde to provide a product which is insoluble in aqueous medium, but which provides timed release of the active antitumor agent when suspended in aqueous medium.

4,625,020

NUCLEOSIDE PROCESS

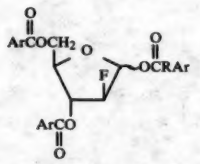
Steven P. Brundidge, Wolcott; Henry G. Howell; Chester Sapino, Jr., both of East Syracuse, all of N.Y., and Chon-Hong Tann, Berkeley Heights, N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 18, 1983, Ser. No. 574,329

Int. Cl.[4] C07H *15/00, 15/06*

U.S. Cl. 536—18.2 **7 Claims**

1. The 2-deoxy-2-fluoroarabinoside having Formula VIa



VIa

wherein Ar is phenyl, naphthyl, substituted phenyl, or substituted naphthyl and said substituent contains up to 4 carbon atoms and is selected from alkyl, alkoxyl, halo, nitro, and dinitro and the 1-α configuration.

4,625,021

HIGH YIELD PROCESS FOR PREPARING BETA-LACTAM ANTIBIOTICS HAVING A HIGH PURITY DEGREE

Umberto Valcavi; Paolo Farina, and Vittorio Marotta, all of Milan, Italy, assignors to Istituto Biochimico Italiano Giovanni Lorenzini S.p.A., Italy

Filed Jun. 3, 1985, Ser. No. 740,251

Claims priority, application Italy, Jul. 30, 1984, 22122 A/84

Int. Cl.[4] C07D *501/04, 501/06, 499/12*

U.S. Cl. 540—230 **5 Claims**

1. A high yield process for preparing penicillin as cephalosporin beta-lactam antibiotics having a high purity degree, characterized in that the acylation of the beta-lactam intermediate is carried out in the presence of a nicotinic or isonicotinic base.

4. The process according to claim 1, characterized in that the said beta-lactam antibiotics are selected from the group consisting of amoxicillin trihydrate, ampicillin trihydrate, cephalexin monohydrate, cefadroxil monohydrate, cephaloglycin and p-hydroxycephaloglycin.

4,625,022

PROCESS FOR PREPARING (S)-3-AMINO-2-OXO-1-AZETIDINESULFONIC ACID SALTS

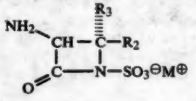
David M. Floyd, Pennington; Alan W. Fritz, Kendall Park, and Christopher M. Cimarusti, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 230,837, Feb. 2, 1981, abandoned. This application Nov. 15, 1985, Ser. No. 798,356

Int. Cl.[4] C07D *205/08;* C07B *13/02*

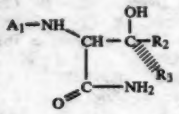
U.S. Cl. 540—355 **5 Claims**

1. A process for preparing a 3-amino-2-oxo-1-azetidinesulfonic acid salt having the formula



which comprises

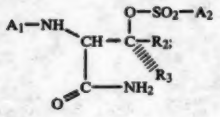
(i) reacting an amino acid amine having the formula



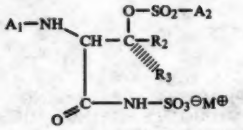
with a compound having the formula

$A_2—SO_2—X$;

(ii) sulfamating the resulting compound having the formula

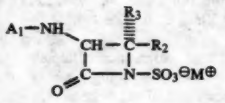


(iii) cyclizing the resulting compound having the formula



by treatment with an alkali metal bicarbonate; and

(iv) deprotecting the resulting compound having the formula



to yield the desired 3-amino-2-oxo-1-azetidinesulfonic acid salt; wherein one of R_2 and R_3 is hydrogen and the other is hydrogen, alkyl of 1 to 10 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, phenyl or substituted phenyl; $M^{\oplus}$ is hydrogen or a cation; A_1 is a nitrogen protecting group; A_2 is alkyl of 1 to 10 carbon atoms, phenyl, or substituted phenyl; and X is chlorine or bromine; wherein "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 halogen, trifluoromethyl, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms groups.

4,625,023

SELECTIVE CONVERSION OF ALIPHATIC AND AROMATIC AMINONITRILES AND/OR DINITRILES INTO LACTAMS

Frank Mares, Whippany; Reginald Y. Tang, Warren; James E. Galle, Madison, and Rose M. Federici, Princeton, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 3, 1985, Ser. No. 771,853

Int. Cl.[4] C07D *201/08, 223/10*

U.S. Cl. 540—539 **48 Claims**

1. A process for the selective conversion of a mixture of an aliphatic or aromatic aminonitrile having a formula $H_2N—D'—C{\equiv}N$ and an aliphatic or aromatic dinitrile having a formula $N{\equiv}C—D—C{\equiv}N$ wherein D' and D are independently a divalent organic moiety, into the corresponding lactam which comprises:

(a) contacting, in the vapor phase, the mixture with an amount of a silica catalyst effective for selectively converting only said aminonitrile into the corresponding lactam at a temperature in the range of from about 200° to about 400° C. and at a pressure of at least about 50 kPa, in the presence of water and optionally in the presence of ammonia, for a time sufficient to convert all or a portion of said aminonitrile into the corresponding lactam; and

(b) contacting, in the vapor phase, the mixture from step (a) comprising and the unreacted dinitrile and the lactam of said aminonitrile, with a catalyst system comprising a finely dispersed hydrogenation catalyst comprising oxides of copper and chromium in combination with one or more finely dispersed co-catalyst selected from the group consisting of titania, zirconia, alumina, silica/alumina, activated alumina and mixtures thereof at a temperature of from about 200° C. to about 400° C. and at a pressure of at least about 50 kPa in the presence of water and hydrogen, and optionally in the presence of ammonia, for a time sufficient to convert all or a portion of said dinitrile into the corresponding lactam.

4,625,024

PROCESS FOR THE PREPARATION OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE 2,2-DIOXIDE AND ITS NON-TOXIC SALTS

Erwin Schmidt, and Karl Clauss, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,563

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429039

Int. Cl.[4] C07D *291/06*

U.S. Cl. 544—2 **15 Claims**

1. A process for the preparation of 6-methyl-3,4-dihydro-1,2,3,-oxathiazin-4-one 2,2-dioxide and its non-toxic salts, which comprises reacting acetoacetamide with an S-O compound of the formula I

$$FSO_2Y \qquad (I)$$

wherein Y=F, Cl, —OSO_2F or —OSO_2Cl, in the presence of a base.

4,625,025

PROCESS FOR PRODUCING A 2H-1,3-THIAZOLIDINE, 2H-TETRAHYDRO-1,3-THIAZINE, OR 2H-HEXAHYDRO-1,3-THIAZEPINE DERIVATIVE SUBSTITUTED AT THE 2 POSITION BY A NITROMETHYLENE GROUP DERIVATIVE

Fumio Iwata; Katsumasa Harada, and Ryoji Sugise, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

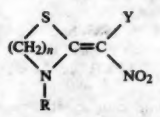
Filed Aug. 10, 1984, Ser. No. 639,919

Claims priority, application Japan, Aug. 25, 1983, 58-154130; Nov. 29, 1983, 58-223339

Int. Cl.[4] C07D *277/10, 279/06, 281/02*

U.S. Cl. 544—53 **10 Claims**

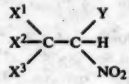
1. A process for producing a heterocyclic compound having a nitromethylene group as the side chain group, of the formula (III):



(III)

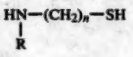
wherein Y represents a hydrogen atom, a halogen atom or a lower alkyl group, R represents a hydrogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, an alkenyl group, an alkynyl group or an acyl group, an n represents an integer of 2, 3 or 4,

which comprises reacting a 2,2,2-trihalo-1-nitroethane compound of the formula (I):



(I)

wherein X^1, X^2 and X^3 may be the same or different and represent halogen atoms, and Y is as defined above,
with a 1-aminoalkanethiol compound or a 1-N-substituted derivative thereof, of the formula (II):



(II)

wherein R is as defined above, and n is as defined above, in the presence of a base selected from the group consisting of an alcoholate of an alkali metal, a hydroxide of an alkali metal and a hydroxide of an alkaline earth metal, and in a solvent selected from the group consisting of a lower aliphatic alcohol, water, dimethyl sulfoxide, acetonitrile and dimethylformamide to form a reaction mixture in said solvent, and said base is added to said reaction mixture in divided portions.

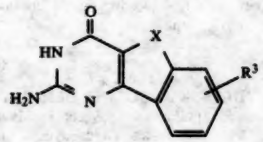
4,625,026

2-AMINO-4-OXO-TRICYCLICPYRIMIDINES HAVING ANTIVIRAL ACTIVITIES AGAINST HERPES SIMPLEX VIRUS TYPE II INFECTIONS

Sun H. Kim, Chestnut Hill, Mass., assignor to Biomeasure, Inc., Hopkinton, Mass.

Continuation-in-part of Ser. No. 454,732, Dec. 30, 1982, abandoned. This application Oct. 13, 1983, Ser. No. 541,777
Int. Cl.[4] C07D *487/00*; A61K *31/505*
U.S. Cl. 544—249 **9 Claims**

1. A compound having in vivo antiviral activity and having the formula:



wherein
X is $(CH_2)_3$; or

where R^4 is lower alkyl having between 1 and 6 carbon atoms, inclusive; and
R^3 is H, lower alkyl having between 1 and 6 carbon atoms, inclusive, lower alkoxy having between 1 and 6 carbon atoms, inclusive, a halogen, or C≡N;
or a pharmaceutically acceptable salt thereof.

8. A method of treating a mammal suffering from a herpes simplex type II infection comprising administering to said mammal a therapeutically effective amount of the compound of any one of claims 1 or 2.

4,625,027

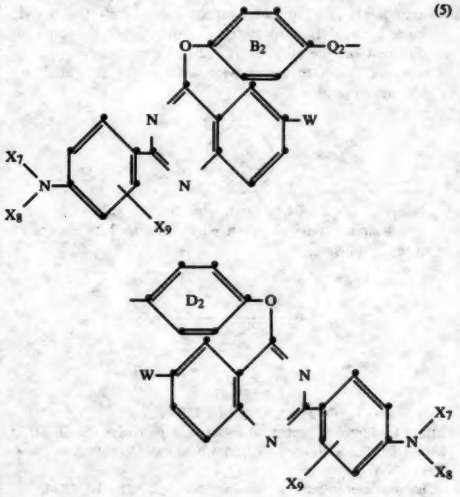
BISQUINAZOLINES USEFUL IN COLOR FORMER SYSTEMS

Rudolf Zink, Therwil, and Ian J. Fletcher, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 14, 1983, Ser. No. 542,226
Claims priority, application Switzerland, Oct. 25, 1982, 6201/82; Jun. 28, 1983, 3523/83
Int. Cl.[4] C07D *401/14, 403/12*
U.S. Cl. 284—129 **3 Claims**

1. A bisquinazoline of the formula

(5)



wherein
Q_2 is straight chain or branched alkylene or alkylidene each of at most 4 carbon atoms, or is cyclohexylidene,
X_7 and X_8 are each lower alkyl, β-cyanoethyl, benzyl or phenyl, or $—NX_7X_8$ is piperidino,
X_9 is hydrogen, methyl, methoxy or ethoxy,
W is hydrogen, halogen, methyl or methoxy and the rings B_2 and D_2 are unsubstituted or substituted by one or two substituents selected from methyl, methoxy and tert-butyl.

4,625,028

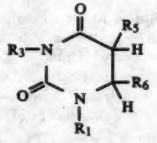
6-ARYLURACILS AND SELECTED NOVEL INTERMEDIATES USED IN THE PREPARATION THEREOF

Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 11, 1983, Ser. No. 512,498
Int. Cl.[4] C07D *239/22, 265/06*
U.S. Cl. 544—309 **2 Claims**

1. A compound having the formula

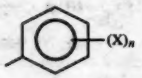
I3/I4



wherein R_1 and R_3 are the same or different and are alkyl of from 1 to 4 carbon atoms, inclusive;

wherein R_5 is hydrogen, and
R_6 is

III$_6$



wherein n is a number of from 0 to 3, inclusive; and
X is hydroxy, alkyl of from 1 to 8 carbon atoms, inclusive, alkoxy of from 1 to 5 carbon atoms, inclusive; alkythio of from 1 to 5 carbon atoms, inclusive; halogen; $-NX_1X_2$; aminoalkyl of from 1 to 3 carbon atoms, inclusive; benyl; phenyl; pyridyl; and wherein X_1 and X_2 are the same or different and are alkyl of from 1 to 8 carbon atoms, inclusive; or taken together with —N are a saturated alkyleneamino group

wherein n' is 3,4,5 or 6 or dialkyl substituted alkyleneamino, wherein each alkyl is from 1 to 3 carbon atoms, inclusive.

4,625,029

NOVEL CYCLIC UREAS

William C. Floyd, Chester, and Bernard F. North, Rock Hill, both of S.C., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 608,712, May 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 579,516, Feb. 13, 1984, abandoned, which is a division of Ser. No. 513,629, Jul. 14, 1983, Pat. No. 4,455,416. This application Mar. 13, 1985, Ser. No. 711,105

Int. Cl.[4] C07D *239/02*

U.S. Cl. 544—309 **5 Claims**

1. A cyclic urea selected from the group consisting of 4-hydroxy-5-methyltetrahydropyrimidin-2-one, 5-methyltetrahydropyrimidin-4-en-2-one, 5,5-dimethyl-4-hydroxyethoxytetrahydropyrimidin-2-one, and mixtures of these.

4,625,030

POTENTIATED NICKEL CATALYSTS FOR AMINATION

Donald C. Best, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 23, 1984, Ser. No. 613,116

Int. Cl.[4] C07D *241/04, 295/00*; C07C *85/06*; B01J *21/08*

U.S. Cl. 544—358 **18 Claims**

1. A process for aminating a lower aliphatic alkane derivative with an amination reagent which is at least one of ammonia, primary amine and secondary amine in the presence of a supported catalyst comprising reacting under amination conditions said alkane derivative with said amination reactant in the presence of hydrogen and a supported catalyst comprising a support material and nickel and iridium wherein said catalyst has a total nickel and iridium content of about 1 to 30 weight percent based on the support and the atom ratio of nickel to iridium is from about 1:1 to 30:1.

4,625,031

SILANE COMPOUNDS

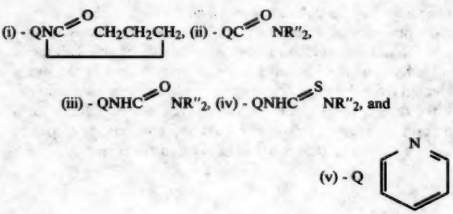
Loren A. Haluska, and Marcella G. Molzahn, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 681,470, Dec. 14, 1984, Pat. No. 4,554,354, which is a continuation of Ser. No. 484,772, Apr. 14, 1983, abandoned, which is a division of Ser. No. 340,160, Jan. 18, 1982, Pat. No. 4,421,893. This application Jun. 10, 1985, Ser. No. 743,210

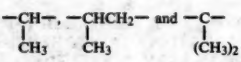
Int. Cl.[4] C07F *7/10*

U.S. Cl. 546—14 **17 Claims**

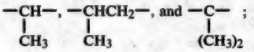
1. A composition of matter which is a silane having the general formula $(XO)_3SiRSR'$ where X is an alkyl radical of 1–4 carbon atoms, R is a divalent aliphatic hydrocarbon radical containing less than five carbon atoms and R' is selected from a group consisting of



wherein Q in (i), (ii), (iii) and (iv) is a radical selected from a group consisting of $-CH_2CH_2-$, $-CH_2CH_2CH_2-$,



and wherein Q in (v) is a radical selected from a group consisting of



wherein in groups (iii) and (iv), R'' is hydrogen or the methyl group and in group (ii), R'' is hydrogen, the methyl group or the isobutoxymethyl group.

4,625,032

TETRAHYDRO-β-CARBOLINE DERIVATIVES

Ikuo Iijima, Urawa; Yutaka Saiga, Ageo; Toshikazu Miyagishima, Wako; Yuzo Matsuoka, Tondabayashi, and Mamoru Matsumoto, Nara, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 4, 1985, Ser. No. 741,133

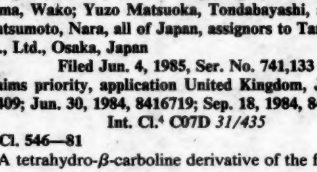
Claims priority, application United Kingdom, Jun. 6, 1984, 8414409; Jun. 30, 1984, 8416719; Sep. 18, 1984, 8423551

Int. Cl.[4] C07D *31/435*

U.S. Cl. 546—81 **6 Claims**

1. A tetrahydro-β-carboline derivative of the formula:

(I)



wherein R^2 is lower alkyl, and either

(A)
R^1 is hydroxymethyl or carboxy,
R^3 and R^4 are both hydrogen, and
X is halogen, lower alkyl, lower alkoxy, hydroxy or benzyloxy; or
(B)
R^1 is hydrogen, carboxy-lower alkyl or a group of the formula: $—CH_2OY$,
Y is lower alkyl, lower alkanoyl or an oxygen-containing monocyclic heterocyclic group selected from the group consisting of tetrahydropyranyl, dihydropyranyl and tetrahydrofuryl,
R^3 is hydrogen, hydroxy-lower alkyl or carboxy,
R^4 is hydrogen or hydroxy-lower alkyl, and
X is hydrogen
or a pharmaceutically acceptable salt thereof.

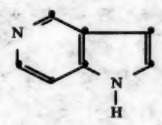
4,625,033

PROCESS FOR PREPARING 5-AZA-INDOLE AND INTERMEDIATES USED IN THIS PROCESS

Jean-Robert Dormoy, and Alain Heymes, both of Sisteron, France, assignors to Sanofi, Paris, France

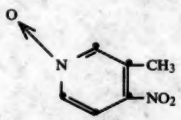
Filed May 28, 1985, Ser. No. 738,438
Claims priority, application France, May 25, 1984, 84 08275
Int. Cl.[4] C07D *471/04, 213/38*
U.S. Cl. 546—113 **17 Claims**

1. Process for preparing 1H-pyrrolo-[3,2-c]-pyridine or 5-aza-indole of formula:



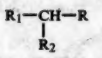
I

whereby 3-methy-4-nitro-pyridine-1-oxide of formula:



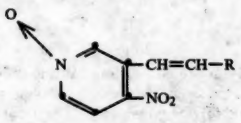
II

is condensed, in a solvent or in the absence of a solvent, with a compound having a formula:



III

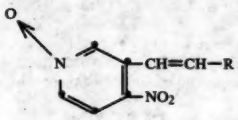
wherein R represents a dimethylamino, diethylamino, dipropylamino, dibutylamino, morpholino, piperidino or pyrrolidino group and R_1 and R_2, which are the same or different, each represent a methoxy, ethoxy or propoxy group or a group R as defined above, to provide an enamine of general formula:



IV

in which R has the same meaning as above which is then submitted in a solvent to reduction cyclisation with hydrogen in the presence of a catalyst to obtain the required 5-aza-indole.

10. Enamines having a formula:



(IV)

in which R represents a dimethylamino, diethylamino, dipropylamino, dibutylamino, morpholino, piperidino or pyrrolidino group.

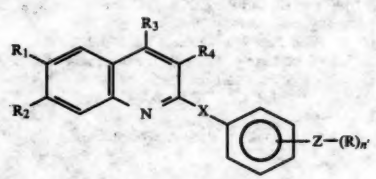
4,625,034

1,2-DIHYDRO; 1,2,3,4-TETRAHYDRO; 5,8 DIHYDRO; AND 5,6,7,8-TETRAHYDROQUINOLINE DERIVATIVES

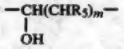
Edward S. Neiss, New Canaan, Conn.; Rohit M. Desai, Millwood, and Raymond D. Youssefyeh, Tarrytown, both of N.Y., assignors to USV Pharmaceutical Corp., Fort Washington, Pa.

Filed Feb. 4, 1985, Ser. No. 697,999
Int. Cl.[4] C07D *215/14, 215/20*
U.S. Cl. 546—152 **23 Claims**

1. A 1,2-dihydro; 1,2,3,4-tetrahydro; 5,8-dihydro; or 5,6,7,8-tetrahydro derivative of a compound of the formula:



and acid salts thereof:
wherein
Z is an alkylene chain containing up to 10 carbon atoms in the principal chain and a total of up to 12 carbon atoms and the said alkylene chain may be attached to the phenyl group through an oxygen atom;
R is the substituent OR_6 attached to one of the carbon atoms of Z in which R_6 is H, lower alkyl or phenyl;
X is $—O(CHR_5)_m—$, alkylene of up to 2 carbon atoms in the principal chain and up to a total of 4 carbon atoms or



wherein
R_5 is H or CH_3;
R_1, R_2, R_3 and R_4 are each H or OH;
n'=1 or 2; and
m=1 or 2.

4,625,035

2,3-DIFLUORO-5-(TRIFLUOROMETHYL)PYRIDINE

John A. Werner, Palo Alto, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 621,343, Jun. 18, 1984, abandoned, which is a division of Ser. No. 401,057, Jul. 23, 1982, Pat. No. 4,480,102. This application Oct. 21, 1985, Ser. No. 789,791
Int. Cl.[4] C07D *213/26*
U.S. Cl. 546—345 **1 Claim**

1. 2,3-Difluoro-5-(trifluoromethyl)pyridine.

4,625,036

ANTIFUNGAL AZOLE COMPOUNDS

Francis T. Boyle, Congleton, United Kingdom, assignor to Imperial Chemical Industries PLC, London, United Kingdom

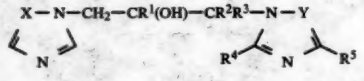
Filed Feb. 21, 1984, Ser. No. 581,672

Claims priority, application United Kingdom, Mar. 8, 1983, 8306351

Int. Cl.[4] C07D *249/08*

U.S. Cl. 548—262 3 Claims

1. A compound of the formula:



wherein X and Y are each a nitrilo radical, R^2, R^3 and R^4 are each a hydrogen atom, R^1 is a phenyl radical which bears one or two substituents selected from trifluoromethyl and halogen, and R^5 is a phenyl or styryl radical similarly substituted.

4,625,037

METHOD FOR MAKING THIOETHER(BISPHTHALIMIDE)S

Thomas L. Evans, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

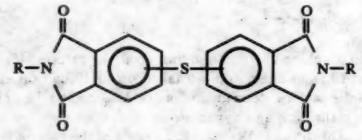
Filed Feb. 2, 1984, Ser. No. 576,224

The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.[4] C07D *209/48*

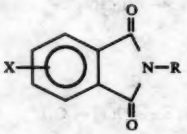
U.S. Cl. 548—461 14 Claims

1. A method of making thioether(bisphthalimide)s of the formula



which comprises:

(a) heating at 25° C. to 150° C. an anhydrous mixture comprising N-substituted phthalimide of the formula,



and an alkali metal hydrogen sulfide in the presence of an organic base selected from the group consisting of triethylamine and tributylamine and (1) a dipolar aprotic solvent or (2) a nonpolar organic solvent with an effective amount of a phosphonium salt phase transfer catalyst of the formula, $P(R')_4^+Br^-$, and

(b) cooling said mixture to precipitate the thioether(bisphthalimide) product from said mixture:

wherein R is a monovalent radical selected from the group consisting of $C_{(1-8)}$ alkyl radicals and $C_{(6-20)}$ aromatic radicals, R' is selected from a group consisting of $C_{(1-6)}$ alkyl radicals and $C_{(6-13)}$ aromatic carbocyclic radicals, M is an alkali metal and X is a nitro radical or a halogen radical.

4,625,038

(2S-TRANS)-4-SUBSTITUTED-2-PYRROLIDINES-METHANOLS

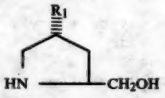
John K. Thottathil, Trenton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 672,989, Nov. 19, 1984, Pat. No. 4,588,819. This application Dec. 23, 1985, Ser. No. 812,701

Int. Cl.[4] C07D *207/08*

U.S. Cl. 548—570 3 Claims

1. A compound having the formula



wherein R_1 is alkyl, cycloalkyl, aryl or arylalkyl;

the term "aryl" refers to phenyl or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino, or trifluoromethyl groups;

the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3 to 7 carbon atoms; and

the term "alkanoyl" refers to groups having 2 to 9 carbon atoms.

2. A compound in accordance with claim 1 wherein R_1 is cycloalkyl.

3. The compound in accordance with claim 1, (2S-trans)-4-cyclohexyl-2-pyrrolidinemethanol.

4,625,039

4-TRISUBSTITUTED SILYL PROTECTED HYDROXY-6-OXO-TETRAHYDROPYRAN-2-YL-ALDEHYDE INTERMEDIATES

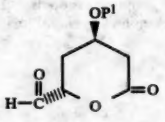
Charles F. Jewell, Jr., Budd Lake, and James R. Wareing, Randolph, both of N.J., assignors to Sandoz Pharm. Corp., E. Hanover, N.J.

Filed Dec. 21, 1983, Ser. No. 563,945

Int. Cl.[4] C07D *309/30*

U.S. Cl. 549—214 4 Claims

1. A compound of the formula:



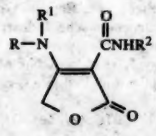
wherein P^1 is a tri-substituted silyl radical, the radicals being independently selected from the group consisting of (a) C_4 to C_8 tertiary alkyl, and (b) phenyl which may be unsubstituted or substituted by up to 2 C_1 to C_4 alkyl, chloro, nitro or trifluoromethyl substituents or monosubstituted in the para-position by phenyl or benzyl, which may be unsubstituted or substituted by one or two of said alkyl, chloro, nitro or trifluoromethyl substituents.

4,625,040
N-(PHENYL) OR N-(PHENYLCYCLOPROPYL)-2,5-DIHYDRO-2-OXO-4[(SUBSTITUTED PHENYL)AMINO]-3-FURANCARBOXAMIDE DERIVATIVES

Vassil S. Georgiev, and Robert A. Mack, both of Rochester, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 653,254, Sep. 24, 1984. This application Mar. 13, 1986, Ser. No. 839,298
Int. Cl.[4] C07D *307/68*
U.S. Cl. 549—321 12 Claims

1. A Compound of the formula:



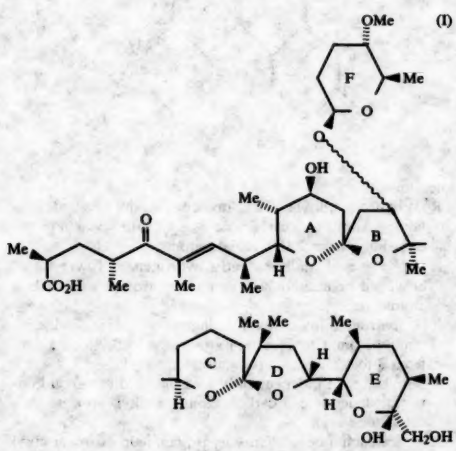
Where R is selected from phenyl and phenyl mono or disubstituted with lower alkyl, nitro, halogenated methyl, halogen, lower alkoxy and combinations thereof;
Where R^1 is selected from hydrogen and lower alkyl; and
Where R^2 is selected from phenyl; phenyl monosubstituted with lower alkyl, nitro, halogenated methyl, halogen and lower alkoxy; and trans-phenylcyclopropyl in which the phenyl group may be substituted with lower alkyl and halogen.

4,625,041
ACIDIC POLYCYCLIC ETHER ANTIBIOTIC

Walter D. Celmer, New London; Walter P. Cullen, East Lyme, both of Conn.; Hiroshi Maeda, Aichi, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 581,384, Feb. 17, 1984, Pat. No. 4,552,843. This application Aug. 29, 1985, Ser. No. 770,472
Int. Cl.[4] C07D *309/10*
U.S. Cl. 549—343 3 Claims

1. The antibiotic of the formula:



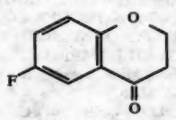
wherein Me is methyl; or a pharmaceutically acceptable cationic salt thereof.

4,625,042
PROCESS FOR PREPARING 6-FLUORO-4-CHROMANONE USING 3-(4-FLUOROPHENOXY)PROPIONITRILE

Satomi Takahashi, Kobe; Yasuyoshi Ueda, Takasago; Yoshio Shimada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

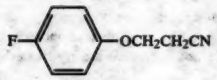
Filed Jul. 8, 1985, Ser. No. 752,439
Claims priority, application Japan, Jul. 9, 1984, 59-142875
Int. Cl.[4] C07D *311/22;* C07C *121/75*
U.S. Cl. 549—401 6 Claims

4. A process for preparing 6-fluoro-4-chromanone having the formula (II):



(II)

which comprises reacting 4-fluorophenol with acrylonitrile in the presence of a tertiary amine to give 3-(4fluorophenoxy)propionitrile having the formula (I):



(I)

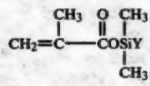
which is then reacted with an acid.

4,625,043
ETHYLIDENENORBORNYL DIMETHYLMETHACRYLOXYSILANE

Nobuhiro Saito, Ohta, Japan, assignor to Toshiba Silicone Co., Ltd., Tokyo, Japan

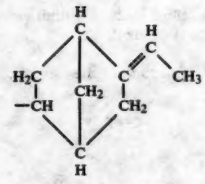
Filed Feb. 26, 1986, Ser. No. 834,096
Claims priority, application Japan, May 31, 1985, 60-116473
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—442 1 Claim

1. An ethylidenenorbornyl dimethylmethacryloxysilane represented by the general formula (I):

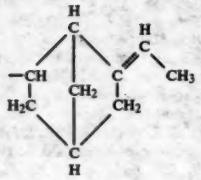


(I)

wherein Y represents the formula:



or the formula:



4,625,044

PROCESS OF PREPARING DIHYDROCARBYL CARBONATES USING A NITROGEN-CONTAINING COORDINATION COMPOUND SUPPORTED ON ACTIVATED CARBON

Gerald L. Curnutt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1984, Ser. No. 612,163
Int. Cl.[4] C07C *68/04*
U.S. Cl. 558—277 13 Claims

1. A process for the preparation of a dihydrocarbyl carbonate which comprises contacting oxygen, carbon monoxide and an alcohol, which can be vaporized under the reaction conditions, in the vapor phase in the presence of a catalyst which comprises a nitrogen-containing coordination compound copper hydrocarbyloxy halide complex supported on activated carbon, under conditions such that a dihydrocarbyl carbonate is prepared.

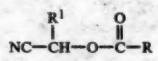
4,625,045

PROCESS FOR THE PREPARATION OF CYANOMETHYL CARBOXYLATES

Andrew T. Au, Needham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

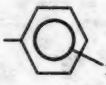
Filed Jul. 19, 1985, Ser. No. 756,904
Int. Cl.[4] C07C *120/00*
U.S. Cl. 558—345 13 Claims

1. A process for preparing compounds of the formula:



(I)

wherein R represents:
(a) $-CCl_3$;
(b) $-CF_3$;
(c) $-CH_2NO_2$;
(d) $-CH_2CN$;
(e) $-CH_2N^{\oplus}(R^2)_3$;
wherein each R^2 is independently alkyl or aryl;



(f)

wherein X is one to three election-withdrawing groups; and R^1 represents H or alkyl;
which comprises
reacting an acyl compound of the formula:

(II)

wherein R is as defined above and T represents:
(a) halo
(b) —CN,

(c)

wherein R^3 is alkyl or aryl;
with an aldehyde and a water soluble metal cyanide, said process occurring in a solvent system under conditions at which the compound of formula I is formed.

4,625,046

ALPHA-TERTIARY NITRILES

Helmut Gebauer, Munich, Fed. Rep. of Germany, assignor to Consortium fur elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed May 1, 1984, Ser. No. 605,889
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328422
Int. Cl.[4] C07C *121/66, 121/30*
U.S. Cl. 558—388 1 Claim

1. A compound which is selected from
2,5-dimethyl-2-ethenyl-4-hexenenitrile,
2-methyl-2-phenylmethyl-3-butenenitrile,
2-(2-propenyl)-2-propyl-3-pentenenitrile, and
5-methyl-2-(1-propenyl)-2-propyl-4-hexenenitrile.

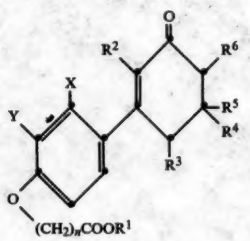
4,625,047

SUBSTITUTED (2,3-DIHYDRO-4-(3-OXO-1-CYCLOHEXEN-1-YL)PHENOXY) ALKANOIC ACIDS, THEIR DERIVATIVES AND THEIR SALTS

Edward J. Cragoe, Jr., Lansdale; Adolph M. Pietruszkiewicz, North Wales, and Otto W. Woltersdorf, Jr., Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 23, 1985, Ser. No. 812,669
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—53 13 Claims

1. A compound of the formula:



(I)

wherein:
R^1 is hydrogen, lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, or a carboxyalkyl group containing from 2 to 6 carbon atoms;
R^2, R^6 are each independently hydrogen or lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms;
R^3 is hydrogen, lower alkyl, branched or unbranched, containing from 1 to 5 carbon atoms, cycloalkyl containing from 3 to 6 nuclear carbon atoms, or aryl;
R^4, R^5 are each independently hydrogen, lower alkyl containing from 1 to 5 carbon atoms, aralkyl, aryl, or halo substituted aryl;
X, Y are each independently hydrogen, halo or lower alkyl containing from 1 to 5 carbon atoms; and
n is 1 to 4;
or the pharmaceutically acceptable salts or derivatives thereof.

4,625,048

CARBAMIC ACID ESTERS

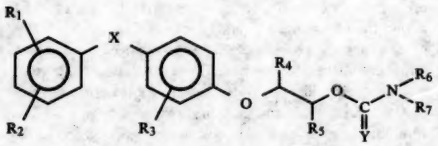
René Zurflüh, Bülach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 408,089, Aug. 13, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 684,412

Int. Cl.[4] C07C *125/06*

U.S. Cl. 560—166 14 Claims

1. A compound of the formula



I

wherein R_1 is hydrogen, halogen, or methyl, R_2 is halogen, methyl, or trifluoromethyl, R_3 is hydrogen, halogen, or methyl, R_4 is hydrogen and R_5 is hydrogen or methyl, R_6 is hydrogen, methyl, or ethyl, R_7 is methyl, ethyl, or isopropyl, X is oxygen, sulfur, methylene, or carbonyl, and Y is oxygen or sulfur, whereby, when X is sulfur, methylene, or carbonyl, or R_3 is halogen or methyl, R_2 can also be hydrogen.

4,625,049

ALCOHOL CARBONYLATION PROCESS USING A BIMETALLIC NICKEL CATALYST

Steven P. Current, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1982, Ser. No. 393,931

Int. Cl.[4] C07C *29/32, 31/08, 45/49, 51/12, 67/36, 33/22*

U.S. Cl. 560—232 10 Claims

1. A process for the preparation of a mixture of oxygenated products selected from carboxylic acids, alcohols, aldehydes and carboxylic acid esters which comprises reacting a primary, secondary, or tertiary alcohol having from one to about twenty carbon atoms with hydrogen and carbon monoxide at a temperature in the range of about 150° C. to 350° C. and a pressure in the range of about 500 psig to 5,000 psig in the presence of a heterogeneous sulfided catalyst comprising a composite of sulfides of a nickel component and a Group V-B, VI-B or Actinide element component cocatalyst and in the absence of a halide promoter wherein the reaction products formed have at least one more carbon atom than the starting alcohol.

4,625,050

ETHER HOMOLOGATION TO ESTERS AND ALCOHOLS USING A HETEROGENEOUS SULFIDED CATALYST

Steven P. Current, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 23, 1983, Ser. No. 507,304

Int. Cl.[4] C07C *29/36, 31/08, 67/37, 69/14*

U.S. Cl. 560—232 5 Claims

1. A process for the conversion of dialkyl ethers to homologous carboxylic acid esters and alcohols which comprises reacting a dialkyl ether having from two to about twenty carbon atoms with hydrogen and carbon monoxide at a temperature in the range of about 150° C. to 350° C. and a pressure in the range of about 500 psig to 5,000 psig in the presence of a heterogeneous sulfided catalyst comprising a composite of sulfides of a nickel component and a Group VI-B element component cocatalyst and in the absence of a halide promoter.

4,625,051

CARBOXYLIC ACID ESTER HOMOLOGATION USING A SULFIDED COBALT CATALYST

Steven P. Current, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 23, 1983, Ser. No. 507,306

Int. Cl.[4] C07C *67/36*

U.S. Cl. 560—265 6 Claims

1. A process for the conversion of carboxylic acid esters to homologous carboxylic acid esters which comprises reacting a carboxylic acid ester having from two to about twenty carbon atoms with hydrogen and carbon monoxide at a temperature in the range of about 150° C. to 350° C. and a pressure in the range of about 500 psig to 5,000 psig in the presence of a heterogeneous sulfided-catalyst comprising a composite of sulfides of a cobalt component and a Group VI-B element component cocatalyst and in the absence of a halide promoter.

4,625,052

PROCESS FOR THE PRODUCTION OF POLYISOCYANATES WHICH HAVE A BIURET STRUCTURE

Klaus König, Leverkusen; Josef Pedain, Cologne, and Helmut Woynar, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 695,144

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403278

The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.

Int. Cl.[4] C07C *127/24*

U.S. Cl. 560—335 8 Claims

1. A process for the production of polyisocyanates which have a biuret structure by reacting an aliphatic diisocyanate with water at elevated temperature in the presence of

(a) an α,α,α-tri-substituted acetic acid which does not have any other isocyanate-reactive groups other than the carboxyl group,

and/or

(b) an anhydride of the acid mentioned in (a),

wherein (a) is present in an amount of up to 0.39 mols per mol of water, (b) is present in an amount of up to about 2 mols per mol of water and the total quantity of (a) and (b) is at least 0.02 to about 2 mols per mol of water.

4,625,053

PROCESS FOR PREPARING OPTICALLY ACTIVE 2-(4-HYDROXY-PHENOXY) PROPIONIC ACID COMPOUNDS

Shoji Fujinawa, Narashino; Isao Hashiba, Ichikawa; Kenji Suzuki, Narashino; Syuzi Tsuchiya, Chiba, and Yasuo Takakuwa, Funabashi, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

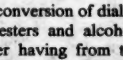
Filed Nov. 6, 1985, Ser. No. 794,566

Claims priority, application Japan, Dec. 28, 1984, 59-279711

Int. Cl.[4] C07C *51/00, 51/02, 51/347*

U.S. Cl. 562—401 8 Claims

1. A process for preparing an optically active 2-(4-hydroxyphenoxy)propionic acid compound, which comprises reacting an optically active compound having the formula:



(I)

wherein X is a chlorine atom or a bromine atom, and M is a hydrogen atom or an alkali metal atom, with hydroquinone or an alkali metal salt of hydroquinone, in the presence of an alkali metal hydroxide and water, and precipitating an optically active di-alkali-meter 2-(4-hydroxyphenoxy)propionate.

4,625,054

PROCESS FOR THE RESOLUTION OF (+)-6-METHOXY-α-METHYL-2-NAPHTHALENEACETIC ACID INTO THE CORRESPONDING ENANTIOMERS

Giuseppe Bernini, Milan, Italy, assignor to Secifarma S.p.A., Milan, Italy

Filed Oct. 11, 1985, Ser. No. 786,669
Claims priority, application Italy, Nov. 20, 1984, 23659 A/84
Int. Cl.[4] C07B 57/00
U.S. Cl. 562—401 6 Claims

1. A process for the resolution of (±)-6-methoxy-α-methyl-2-naphthaleneacetic acid into the corresponding enantiomers, wherein the (±)-6-methoxy-α-methyl-2-naphthaleneacetic acid is reacted with an aminodiol selected from the group consisting of L-threo-(±)-2-amino-1-(4-nitrophenyl)-1,3-propanediol and L-threo-(+)-2-amino-1-(4-methylmercaptophenyl)-1,3-propanediol, in acid:aminodiol molar ratio ranging from 3:1 to 4.5:1, in an inert solvent wherein the aminodiol salt with L(−)-6-methoxy-α-methyl-2-naphthaleneacetic acid is less soluble than the diastereoisomer salt; the obtained precipitate is separated; the filtered mother liquors are treated with ammonia, or with a lower alkylamine, in an amount sufficient to precipitate substantially all the (±)-6-methoxy-α-methyl-2-naphthaleneacetic acid, still in solution, in form of ammonium or alkylammonium salt, which is separated; a base is added to the mother liquors suited to yield, with the D(+)-6-methoxy-α-methyl-2-naphthaleneacetic acid, an isoluble or poorly soluble salt in the used solvent; and from the so isolated salt, D(+)-6-methoxy-α-methyl-2-naphthaleneacetic acid is recovered with mineral or organic acids.

4,625,055

PREPARATION OF CARBOXYLIC ACIDS

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., Little Ferry, N.J.

Continuation of Ser. No. 431,451, Sep. 30, 1982, abandoned. This application Jun. 3, 1985, Ser. No. 741,030
The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.
Int. Cl.[4] C07C 51/14
U.S. Cl. 562—406 4 Claims

1. A process for the preparation of a carboxylic acid which comprises reacting an ethylenically unsaturated compound having the general structure $R_2R_1C{=}CR_3R_4$ wherein, R_1, R_2, R_3 and R_4 are hydrogen or the same or different alkyl or cycloalkyl, or wherein one of said R_1 and R_2 and one of said R_3 and R_4 together form a single alkylene group having from 2 to about 8 carbon atoms with carbon monoxide in the presence of water, in the presence of a molybdenum-nickel-alkali metal, a tungsten-nickel-alkali metal or a chromium-nickel-alkali metal co-catalyst component, and being free from organic promoters selected from the group consisting of organo-phosphorus compounds and organo-nitrogen compounds and in the presence of a halide.

4,625,056

PROCESS FOR PRODUCING BENZENE CARBOXYLIC ACIDS FROM AROMATIC MATERIAL UTILIZING AN ALIPHATIC ORGANIC ACID AGENT

James R. Graham, Fountain Valley, Calif., and John G. Huntington, Arvada, Colo., assignors to Occidental Research Corporation, Los Angeles, Calif.

Filed Dec. 19, 1979, Ser. No. 105,355
Int. Cl.[4] C07C 51/16
U.S. Cl. 562—407 28 Claims

1. A process for producing terephthalic acid from coal comprising:

a. treating in an oxidation zone a mixture of coal, water, potassium carbonate, and an amount of an aliphatic organic acid or a salt thereof effective for increasing the yield of benzene carboxylic acid salt, with oxygen at an oxidation temperature of from about 250° to about 310° C., an oxidation pressure of from about 50 to about 140 dyens·10^6 per square centimeter, an average residence time of treatment with oxygen of from about 10 minutes to about 4 hours, and an amount of said aliphatic organic acid or a salt thereof of from about 0.01 to about 1 parts per part of coal, to convert said coal to a water soluble potassium benzene carboxylic acid salt, said aliphatic organic acid having a carboxyl group or salt thereof connected directly to an aliphatic group, said aliphatic organic acid increasing the yield of benzene carboxylic acid salt thusly produced from said aromatic material by an amount higher than an amount of said benzene carboxylic acid salt produced in the absence of said aliphatic organic acid or a salt thereof, thereby producing a first solution containing dissolved therein said water soluble potassium benzene carboxylic acid salt and carbon dioxide;

b. removing a gaseous stream comprising said carbon dioxide from said oxidation zone;

c. separating undissolved solids from said first solution to produce an essentially solids-free first solution;

d. removing sufficient water from said essentially solids-free first solution so that said water soluble potassium benzene carboxylic acid salt can be isomerized, thereby producing a dried potassium benzene carboxylic acid salt mixture;

e. isomerizing said dried potassium benzene carboxylic acid salt mixture by heating under an atmosphere comprising carbon dioxide to produce a dipotassium terephthalic acid salt;

f. utilizing a first portion of said gaseous stream comprising said carbon dioxide to form said atmosphere comprising carbon dioxide in said isomerization zone;

g. dissolving said dipotassium terephthalic acid salt in a first dipotassium terephthalate solution in a dissolving zone to produce a second dipotassium terephthalate solution;

h. separating undissolved solids in said second dipotassium terephthalate solution from said solution, thereby producing an essentially solids-free second dipotassium terephthalate solution;

i. treating said essentially solids-free second dipotassium terephthalate solution in a precipitation zone with carbon dioxide to produce and precipitate monopotassium terephthalate and to produce a potassium bicarbonate solution;

j. utilizing a second portion of said gaseous stream comprising said carbon dioxide as said carbon dioxide used in said precipitation zone;

k. separating said precipitated monopotassium terephthalate from said potassium bicarbonate solution, thereby producing a separated precipitated monopotassium terephthalate and a separated potassium bicarbonate solution;

l. converting said separated potassium bicarbonate solution to a potassium carbonate solution;

m. utilizing said potassium carbonate solution as at least a portion of said potassium carbonate and said water used in said oxidation zone;

n. heating a mixture of said separated precipitated monopotassium terephthalate and water under conditions of elevated temperature sufficient to produce and precipitate terephthalic acid and to produce a third dipotassium terephthalate solution;

o. separating said precipitated terephthalic acid from said third dipotassium terephthalate solution, thereby producing a terephthalic acid product and a separated third dipotassium terephthalate solution; and

p. utilizing said separated third dipotassium terephthalate solution as at least a portion of said first dipotassium terephthalate solution used in said dissolving zone.

4,625,057

PROCESS FOR THE PRODUCTION OF CARBOXYMETHYLATED ALCHOLS, ETHER ALCOHOLS, THIOALCOHOLS, OR ALKYL PHENOLS

Hermann Springmann, Haltern, and Kurt Kosswig, Marl, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 12, 1983, Ser. No. 522,771

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1982, 3230677

Int. Cl.[4] C07C *59/48*

U.S. Cl. 562—470 17 Claims

1. A process for the production of a carboxymethylated (thio)alcohol, (thio)alcohol ether, alkyl phenol or alkyl phenol ether,

comprising simultaneously adding an aqueous solution of up to a stoichiometric quantity of monochloroacetic acid based on the amount of alcohol or phenol compound, and a separate aqueous solution of about twice the stoichiometric amount of an alkali or alkaline earth metal hydroxide, based on the amount of monochloroacetic acid, under agitation, at a temperature of about 60°–140° C. and under a pressure of about 10–100 mbar, to a starting compound which is a saturated or unsaturated, aliphatic (thio)alcohol of 8–20 carbon atoms, a (di)-C_{7-18}-alkyl phenol or such a (thio)alcohol or phenol compound which has been oxethylated with 1–40 ethylene oxide units,

while maintaining the water content in the reaction mixture in the range of 0.3–1.25% by weight of the total mixture, throughout the reaction period.

4,625,058

PREPARATION OF AN OXY-ACETYL COMPOUND

Takaaki Fujiwa, and Hidetaka Kojima, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Mar. 12, 1985, Ser. No. 710,821

Claims priority, application Japan, Mar. 23, 1984, 59-56542

Int. Cl.[4] C07C *51/12, 51/54*

U.S. Cl. 562—519 12 Claims

1. A carbonylation process for preparing an oxy-acetyl compound, which comprises: reacting carbon monoxide with an oxy-methyl material selected from the group consisting of methyl carboxylates, dimethyl ether and mixtures thereof with methanol, in the presence of a rhodium catalyst, an iodine compound, a metallic accelerator in which the metal is selected from the group consisting of aluminum, chromium and titanium, and in the presence of a boron compound, the atomic ratio of boron relative to the metal of the metallic accelerator being in the range of from 0.1–15.0 to 1.

7. A carbonylation process for preparing an oxy-acetyl compound, which comprises: reacting carbon monoxide with an oxy-methyl material selected from the group consisting of methyl carboxylates, dimethyl ether and mixtures thereof with methanol, in the presence of a rhodium catalyst, an iodine compound, a metallic accelerator in which the metal is selected from the group consisting of aluminum, chromium and titanium, and in the presence of a bismuth compound, the atomic ratio of bismuth relative to the metal of the metallic accelerator being in the range of from 0.05–2.0 to 1.

4,625,059

PROCESS FOR PURIFICATION OF 1,2-UNSATURATED CARBOXYLIC ACIDS AND/OR ESTERS THEREOF

Takeshi Shibano; Yasuyuki Sakakura; Kiichi Ito, and Kazuhiko Higuchi, all of Yokkaichi, Japan, assignors to 501 Mitsubishi Petrochemical Company, Ltd., Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,772

Claims priority, application Japan, Jun. 24, 1983, 58-112646

Int. Cl.[4] C07C *51/48*

U.S. Cl. 562—600 9 Claims

1. A process for purifying a 1,2-unsaturated carboxylic acid and or esters thereof selected from the group consisting of alkenoic acids having 3 to 6 carbon atoms and esters thereof, which 1,2-unsaturated carboxylic acid and or esters thereof contains aldehyde impurities, which comprises treating the alkenoic acid and/or the ester with a mercaptan compound at a temperature of 20°–120° C. in the presence of an acid catalyst.

4,625,060

PREPARATION OF ACETIC ACID

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 219,786, Dec. 24, 1980. This application May 28, 1981, Ser. No. 268,029

Int. Cl.[4] C07C *53/08, 51/353, 51/12*

U.S. Cl. 562—607 4 Claims

1. A process for the preparation of acetic acid which comprises heating methyl formate with carbon monoxide in the presence of a molybdenum-nickel co-catalyst or a tungsten-nickel co-catalyst, in the presence of a halide and in the presence of a promoter comprising an organo-phosphorus compound or an organo-nitrogen compound wherein the phosphorus and nitrogen are trivalent.

4,625,061

PROCESS FOR PREPARING CYANAMIDE

Rudolf van Hardeveld; Theodorus J. van de Mond, both of Geleen, and Franciscus H. A. M. J. Vandenbooren, Maastricht, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Mar. 6, 1985, Ser. No. 708,844

Claims priority, application Netherlands, Mar. 6, 1984, 8400717

Int. Cl.[4] C07C *125/08;* C07D *251/60, 251/58;* B01J *29/18*

U.S. Cl. 564—103 3 Claims

1. An improved process for the preparation of cyanamide or a cyanamide-containing gas mixture by passing urea and/or urea decomposition products over a catalyst at a temperature in the range of between about 200° C. and 600° C., said improvement essentially comprising utilizing as said catalyst a porous catalyst having an intracrystalline pore diameter of at most 8 Å wherein the outer surface of said catalyst has been rendered catalytically inert while leaving the interior surface within said pores catalytically active.

4,625,062

PROCESS FOR PRODUCING 4-ALKOXYANILINES

Teruyuki Nagata; Akihiro Tamaki; Hiroki Ohnishi, and Hideki Mizuta, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

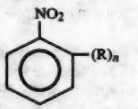
Filed Nov. 27, 1984, Ser. No. 675,225

Claims priority, application Japan, Nov. 28, 1983, 58-222237

Int. Cl.[4] C07C *85/11*

U.S. Cl. 564—416 9 Claims

1. Process for producing a 4-alkoxyaniline, which comprises catalytically hydrogenating a nitrobenzene represented by the following formula:



(I)

wherein R represents a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group, and n is 1 or 2, provided that when R is other than hydrogen, it is bonded to the o-position and/or the m-position to the nitro group, in the presence of a catalytically effective amount of a noble metal catalyst which is selected from the group consisting of (i) platinum on activated carbon, (ii) palladium on activated carbon and (iii) mixture of platinum and palladium on activated

carbon, in a mixed solvent containing a lower aliphatic alcohol, sulfuric acid, and water or a lower aliphatic carboxylic acid or both, said mixed solvent comprising at least 10 moles, per mole of the nitrobenzene, of the lower aliphatic alcohol, 1 to 10 moles, per mole of the nitrobenzene, of sulfuric acid, and 2 to 30 percent by weight of water, the lower aliphatic carboxylic acid or both, at a temperature of from 0° C. to the boiling point of the mixed solvent and at a pressure of from atmospheric pressure to 2 kg/cm^2-G.

4,625,063

PRODUCTION OF TERTIARY AMINE

Yukinaga Yokota, Osaka; Yuji Sawamoto, Wakayama; Hideki Taniguchi, Wakayama, and Kazuhiko Okabe, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 741,979

Claims priority, application Japan, Jun. 29, 1984, 59-134447

Int. Cl.^{4} C07C *85/06, 85/08*

U.S. Cl. 564—480 **6 Claims**

1. A process for manufacturing a tertiary amine, which comprises the steps of reacting an alcohol or an aldehyde with a primary amine or a secondary amine, in the presence of a catalyst of copper metal, nickel metal and an element belonging to the Group VIII noble metals of the Periodic Table, at a temperature of 150° to 250° C., at a pressure in the range of from atmospheric pressure to 5 atmospheres, while removing out the water formed by the reaction, and separating the obtained tertiary amine.

4,625,064

METHOD FOR PRODUCING BIS [β(N,N-DIMETHYLAMINO)ETHYL]ETHER

Sadakatsu Kumoi, Hikari; Keiji Mitarai, Shinnanyo, and Yukihiro Tsutsumi, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,312

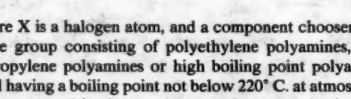
Claims priority, application Japan, Apr. 7, 1983, 58-60076

Int. Cl.^{4} C07C *93/04*

U.S. Cl. 564—486 **6 Claims**

1. A method for producing bis[β-(N,N-dimethylamino)-ethyl]ether comprising:

(a) providing a mixture of an aqueous solution of a bismethohalide of bis[β-(N,N-dimethylamino)ethyl]ether represented by the formula:



where X is a halogen atom, and a component choosen from the group consisting of polyethylene polyamines, polypropylene polyamines or high boiling point polyamines, all having a boiling point not below 220° C. at atmospheric pressure and having a primary amino group in the molecule thereof;

(b) distilling said mixture at a temperature of 120° C. or less under reduced pressure to remove water from the mixture and increase the concentration of said bismethohalide to water to not lower than 85% by weight and to form a heterogeneous mixture consisting of a solid-liquid phase n which a part of said bismethohalide is dispersed in said polyamine;

(c) reacting the bismethohalide and polyamine in said heterogeneous mixture at a temperature of not lower than 140° C. to form said bis[β-(N,N-dimethylamino)ethyl]ether; and

(d) recovering the bis[β-(N,N-dimethylamino-ethyl]ether.

4,625,065

PROCESS FOR PREPARATION OF TRIMETHYLSULFOXONIUM SALTS

James B. Heather, Hercules, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 510,144, Jul. 1, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 710,783

Int. Cl.^{4} C07C *161/00*

U.S. Cl. 568—27 **4 Claims**

1. A process for the preparation of trimethylsulfoxonium salts which consists essentially of reacting a trimethylsulfonium salt of the formula

$$(CH_3)_3S^+X^-$$

wherein X represents an anion, with a catalytic amount of a ruthenium tetraoxide oxidant prepared in situ from soluble, low valent ruthenium species with a stoichiometric amount of a suitable co-oxidant capable of oxidizing ruthenium from a III or IV to VIII oxidation state, selected from the group consisting of sodium periodate, sodium hypochorite and tertiary butyl hypochlorite, in the presence of an inert solvent at a temperature and for a sufficient period of time to cause formation of said trimethylsulfoxonium salt.

4,625,066

SUBSTITUTED ACETYLENE-KETONES

Hans-Ludwig Elbe, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 29, 1984, Ser. No. 676,128

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343531

Int. Cl.^{4} C07C *49/217*

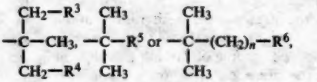
U.S. Cl. 568—308 **8 Claims**

1. A substituted acetylene-ketone of the formula

$$R^2—C{\equiv}C—CO—R^1$$

in which

R^1 is



R^2 is straight chain or branched alkyl with 1 to 12 carbon atoms, cycloalkenyl with 5 to 7 carbon atoms the cycloalkenyl ring being mono-, di- or tri-substituted by identical or different alkyl radicals with 1 to 4 carbon atoms, or

R^2 is cycloalkylalkyl with 3 to 7 carbon atoms in the cycloalkyl part and 1 to 4 carbon atoms in the alkyl part, or is cycloalkylalkyl with 3 to 7 carbon atoms in the cycloalkyl part and 1 to 4 carbon atoms in the alkyl part, the cycloalkyl part being mono-, di- or tri-substituted by identical or different alkyl radicals with 1 to 4 carbon atoms, or

R^2 is phenyl or phenylalkyl with 1 to 4 carbon atoms in the alkyl part, or is phenyl which is mono-, di- or tri-substituted by identical or different substituents selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, nitro, cyano, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part, phenyl, halo-substituted phenyl, phenoxy and halo-substituted phenoxy, or is phenylalkyl with 1 to 4 carbon atoms in the alkyl part, which phenyl moiety is mono-, di- or tri-substituted by identical or different substituents

selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, nitro, cyano, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part, phenyl, halo-substituted phenyl, phenoxy and halo-substituted phenoxy,

R^3 is fluorine, chlorine or bromine,

R^4 is hydrogen, fluorine, chlorine or bromine,

R^5 is straight-chain or branched alkyl with 2 to 6 carbon atoms, straight-chain or branched alkenyl with 2 to 4 carbon atoms, straight-chain or branched alkinyl with 3 to 5 carbon atoms or a group selected from formyl, oxime, oxime ether, acetal, dioxolane, substituted dioxolane, dioxane and substituted dioxane, or

R^5 is methyl, if R^2 is optionally substituted cycloalkenyl or optionally substituted cycloalkylalkyl,

R^6 is cyano, phenyl, or phenyl which is mono-, di- or tri-substituted by identical or different substituents selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, nitro, cyano, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part, phenyl, halo-substituted phenyl, phenoxy and halo-substituted phenoxy, or

R^6 is the grouping $-XR^7$, wherein

R^7 is straight-chain or branched alkyl with 1 to 6 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, phenyl, phenylalkyl with 1 or 2 carbon atoms in the alkyl part, or phenyl which is mono-, di- or tri-substituted by identical or different substituents selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, nitro, cyano, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part, phenyl, halo-substituted phenyl, phenoxy and halo-substituted phenoxy, or

R^7 is phenylalkyl with 1 or 2 carbon atoms in the alkyl part, the phenyl part being mono-, di- or tri-substituted by identical or different substituents selected from halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, nitro, cyano, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part, phenyl, halo-substituted phenyl, phenoxy and halo-substituted phenoxy,

X is O, S, SO or SO_2 and the index

n is 0 or 1.

4,625,067

HYDROFORMYLATION CATALYST REMOVAL

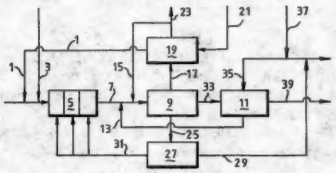
Jean A. A. Hanin, Rixensart, Belgium, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 27, 1985, Ser. No. 803,087

Claims priority, application United Kingdom, Nov. 30, 1984, 8430225

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—451 22 Claims



1. The method for removing cobalt values from the crude product of a cobalt-catalyzed hydroformylation reaction, said crude product containing cobalt compounds in addition to an organic hydroformylation reaction product, which comprises: (a) contacting said crude product with a stream of stripping gas in the presence of water or aqueous acid at a temperature of not greater than 100? C. and at a pressure below 10 atmospheres, said pressure being lower than the decomposition pressure of said cobalt compounds at said contacting temperature, to entrain volatile cobalt compounds in said stripping gas and to form an aqueous phase containing cobalt values dissolved therein; and (b) separating said aqueous phase from said organic hydroformylation reaction product.

4,625,068

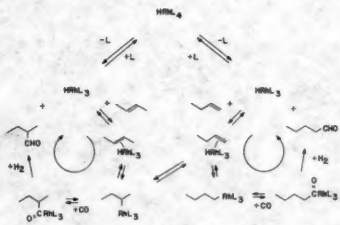
RHODIUM CATALYZED HYDROFORMYLATION OF INTERNAL OLEFINS

David A. Young, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Florham Park, N.J.

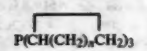
Filed Mar. 20, 1985, Ser. No. 714,112

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 12 Claims



1. In a process for hydroformylation of an internal olefin selected from the group consisting of aliphatic olefins, cycloaliphatic olefins, and substituted derivatives thereof wherein the substituent comprises alkyl, aryl, alkaryl, aralkyl, cycloalkyl, hydroxy, —CHO and —C(O)OX, where X is alkyl of 1 to 20 carbon atoms in a hydroformylation reaction zone in the presence of a liquid rhodium triorgano phosphine catalyst system and in the presence of carbon monoxide and hydrgoen to form the corresponding aldehydes, the improvement which comprises employing in the reaction zone at least one sterically hindered tricycloalkylphosphine selected from the group consisting of compounds having the formula:



wherein "n" is an integer of 1–12, inclusive; and maintaining in the reaction zone a reaction temperature of from about 80° to 200° C., and a total carbon monoxide and hydrogen pressure of from about 3500 to 14,000 kPa, whereby improved hydroformylation reaction rates are achieved.

4,625,069

FLUOROCHEMICAL RHODIUM COMPOUNDS

Allen R. Siedle, Lake Elmo, and Richard D. Howells, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Division of Ser. No. 541,129, Oct. 12, 1983, Pat. No. 4,556,720.
This application Aug. 26, 1985, Ser. No. 769,590
Int. Cl.[4] C07C *45/50*
U.S. Cl. 568—454 12 Claims

1. In a process for olefin isomerization comprising the steps of:

reacting an olefin compound having at least one carbon-to-carbon double bound in the presence of a catalytically effective amount of a coordination compound of rhodium, optionally in the presence of heat, and recovering the resulting isomerized olefin product,

the improvement comprising using as said catalyst a rhodium coordination compound having the formula:

$$[(aryl)_3P]_3Rh^+(counterion)^- \text{ or}$$

$$[(aryl)_3P]_3Rh(CO)_n^+(counterion)^-$$

wherein

aryl is phenyl, phenyl substituted by 1 to 3 methyl groups, or for one aryl group, polystyryl,

n is the integer 1 or 2,

(counterion)$^-$ is the conjugate base of acids selected from $HC(R)(SO_2R_f)_2$, $R_f'SO_3H$, and $HN(SO_2R_f)_2$

wherein

R_f is a perfluoroalkyl group having 1 to 20 carbon atoms,

R_f' is a perfluoroalkyl group having 4 to 20 carbon atoms, and

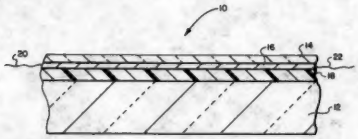
R is lower alkyl, phenyl, Cl, H, SO_2R_f, or R_f.

4,625,070

LAMINATED THIN FILM SOLAR MODULE

Elliot Berman, Los Angeles, and Kimberly P. Eisner, Woodland Hills, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 30, 1985, Ser. No. 771,543
Int. Cl.[4] H01L *31/06, 25/02*
U.S. Cl. 136—249 7 Claims



1. A solar module comprising:
a first untempered glass sheet having a first side forming a light receiving face of a solar module and a second side,
a thin film photovoltaic device fabricated on the second side of said first glass sheet,
a second tempered glass sheet spaced from the second side of said first sheet and forming the primary structural member of said solar module; and
a pottant layer filling substantially all space between said first and second glass sheets and bonding said sheets together.

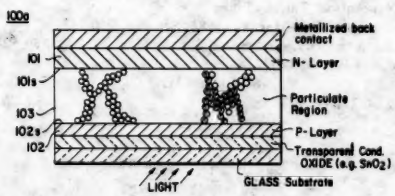
6. A solar module according to claim 1 further including a second thin film photovoltaic device fabricated on a surface of said second tempered glass sheet.

4,625,071

PARTICULATE SEMICONDUCTORS AND DEVICES

Alan E. Delahoy, Rocky Hill; Frank B. Ellis, Jr., and Albert Rose, both of Princeton, all of N.J., assignors to Chronar Corp., Princeton, N.J.

Filed Nov. 5, 1984, Ser. No. 668,131
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—250 10 Claims



1. A semiconductor device comprising a first semiconductor, polymer or metal contact; a second semiconductor, polymer or metal contact; and a body comprising a plurality of particles of semiconductive material extending as different chains between and contacting respectively said first contact and said second contact.

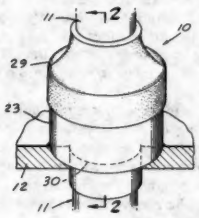
4,625,072

CABLE SHIELD TERMINATION MEANS

Michael K. VanBrunt, Playa del Rey, Calif., assignor to G&H Technology, Inc., Greenwich, Conn.

Filed Jan. 14, 1985, Ser. No. 691,170
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 R 6 Claims

1. Apparatus for electrically terminating the shield of a shielded cable to panel wall edge portions defining an opening through which the cable passes, comprising:
conductive tubular contact means including a radially extending flange located intermediate the contact means ends such that first and second portions of the contact means extend away from the flange in respectively opposite directions, said contact means having an internal bore permitting receipt onto the cable in contacting relationship with the cable shield;
receiver tube means having a bore sufficient to receive the cable therethrough, said tube means having an internal shoulder against which one side of the contact means flange abuts with the contact means first portion being received within the receiver tube means bore; and
nut means threaded onto the receiver tube means and having a bore and a portion of the nut means which abuts against the other side of the contact means flange, the contact means second portion being received within the nut means bore.

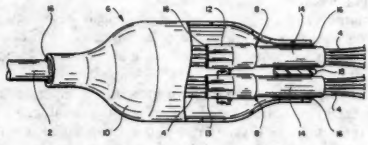


4,625,073

CABLE HAVING A BRANCH-OFF REGION SEALED WITH A BRANCH-OFF ARTICLE AND METHOD OF MAKING SAME

Louis Breesch, Cupertino, Calif., and Antonino Berrondo, Mexico City, Mexico, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Mar. 11, 1985, Ser. No. 710,203
Int. Cl.[4] H02G *15/04, 15/23*
U.S. Cl. 174—72 R 10 Claims



1. In combination, a cable with a plurality of break-out members extending therefrom at a branch-off region and a branch-off article sealing the branch-off region, the branch-off article comprising:
at least two branch-off members each including a body portion and at least two tubes extending from the body portion, end portions of the tubes being formed of a dimensionally recoverable material and being remote from the body portion, individual ones of the break-out members extending through respective individual ones of the tubes, each tube having a length and flexibility such that a first tube can be bent away from the others to an extent permitting the end portion thereof to be recovered about its respective break-out member without substantially recovering end portions of the other tubes;
a recoverable member surrounding the tubes and forming a pressure seal with the body portions of the at least two branch-off members, the ends of the tubes being enclosed by the recoverable member; and
a clip secured to the recoverable member and between the body portions of the at least two branch-off members and forming a pressure seal thereat.

10. A method of sealing a plurality of break-out members

extending from a branch-off region of a pressurized cable, comprising the steps of:

disposing the break-out members through respective tubes, end portions of each tube being formed of a dimensionally recoverable material and extending from at least two body portions and being remote thereto, each tube having a length and flexibility such that a first tube can be bent away from the others to an extent permitting the end portion thereof to be recovered about its respective break-out member without substantially recovering the end portions of the other tubes;

recovering the end portion of the first tube about its respective break-out member so as to form a seal therebetween; and

surrounding the tubes with a recoverable member and a clip, the clip being disposed between the at least two body portions and being secured to the recoverable member forming a pressure seal with the body portions and the recoverable member, the end portions of the tubes being enclosed by the recoverable member and the clip.

4,625,074

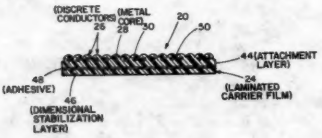
MASS TERMINABLE FLAT CABLE

Albert R. Cox, Centerville, Ind., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 5, 1985, Ser. No. 708,084

Int. Cl.[4] H01B 7/08

U.S. Cl. 174—117 F **13 Claims**



1. A flat cable for use with a mass termination connector having a plurality of regularly spaced terminal elements, said flat cable comprising:

a laminated carrier film; and

a plurality of discrete conductors held in regularly spaced parallel relationship by said carrier film, each conductor having an insulative jacket made of a thermoplastic material,

said carrier film including an attachment layer of thermoplastic insulation having a melting temperature similar to that of the jacket material, and a dimensional stabilization layer made of an insulative material having a melting temperature higher than those of the attachment layer and the jacket material and displaying dimensional stability at the melting temperatures of the attachment layer and jacket material, the jackets of said conductors being fused to said attachment layer and said attachment layer being held by said stabilization layer, said flat cable having a substantially flat side and an opposite undulating side with each undulation formed by one of the jacketed conductors.

4,625,075

PATTERNED CONDUCTIVE INK TOUCH PANEL

Robert P. Jaeger, Moorpark, Calif., assignor to Sierracin Corporation, Sylmar, Calif.

Filed Sep. 25, 1984, Ser. No. 654,374

Int. Cl.[4] G08C 21/00

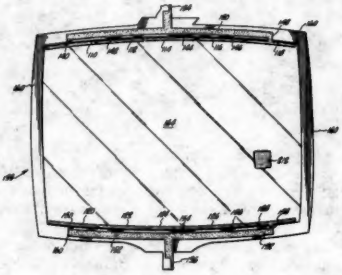
U.S. Cl. 178—18 **20 Claims**

1. An element for use in a touch panel which generates signals representing the input positions applied thereto, the element comprising:

(a) a flexible planar or curved member having a layer of conductive material coated on one surface thereof;

(b) a first array of conductive segments formed along an edge of the flexible planar or curved member and in contact with the conductive material;

(c) a conductive member comprising a first portion which is adjacent to the array of conductive segments and a second portion which includes a terminating end portion, the terminating end portion allowing connection of the touch panel to external means; and



(d) separate connecting conductive members for connecting certain of the conductive segments of the first array to the first portion of the conductive member, the connecting members being patterned such that the total resistance from each connected segment to the terminating end portion is substantially the same, the resistance of at least two of the connecting conductive members being different.

4,625,076

SIGNED DOCUMENT TRANSMISSION SYSTEM

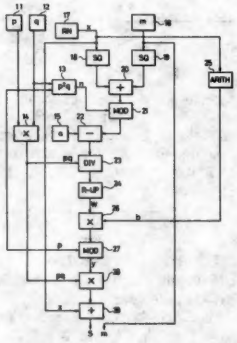
Tatsuaki Okamoto, Yokosuka; Shoji Miyaguchi, Yokohama; Akira Shiraishi, and Tsukasa Kawaoka, both of Yokosuka, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,253

Claims priority, application Japan, Mar. 19, 1984, 59-52696; Mar. 4, 1985, 60-42052

Int. Cl.[4] H04L 9/00

U.S. Cl. 178—22.11 **25 Claims**



25. A signed document transmission system comprising:

a p-setting register for setting a secret key p (a prime number);

a q-setting register for setting a secret key q (a prime number);

a first multiplier for multiplying the outputs p and q from the p- and the q-setting registers to obtain pq;

an n-generator for generating a public key $n=p^2q$ obtained by an operation based on the outputs p and q from the p- and the q-setting registers;

a first hash processor for obtaining a hashed document M by hashing a document m to be transmitted;

a random number generator for generating a random number x;

a first congruent polynomial operating unit for performing a modulo-n operation of a polynomial f(x)(mod n) of second or higher degree using the random number x as a variable;

a subtractor for obtaining the difference between the output of the first congruent polynomial operating unit and the hashed document M from the first hash processor;

a first ϵ-setting register for setting a public key ϵ of the order of $n^{\frac{1}{3}}$;

a first δ-setting register for setting a public key δ of the order between 1 and $n^{\frac{1}{3}}$;

a W-operating unit supplied with the output Z of the subtractor, the output pq of the first multiplier, the output ϵ of the first ϵ-setting register and the output δ of the first δ-setting register, for obtaining W which meets the following conditions

$$Z \leqq Wpq + V\epsilon\delta < Z + \delta$$

$$Z = -g(m) - \{f(x) (\mathrm{mod}\ n)\};$$

a round-up operating unit for obtaining the smallest integer equal to or larger than the output value of the W-operating unit;

a second congruent polynomial operating unit supplied with the random number x from the random number generator, for performing a modulo-p operation of a differential value of the polynomial f(x);

a congruent divider for dividing the output W of the W-operating unit by the output of the second congruent polynomial operating unit to modulus p;

a second multiplier for multiplying the output y of the congruent divider and the output pq of the first multiplier;

an adder for adding together the output ypq of the second multiplier and the random number x from the random number generator to obtain a signature S;

means for transmitting the signature S and the document m;

means for receiving the transmitted signature S and document m;

an n-setting register for setting the public key n;

a second ϵ-setting register for setting the public key ϵ;

a second δ-setting register for setting the public key δ;

a third congruent polynomial operating unit for performing a modulo-n operation of the polynomial f(X) using the received signature S instead of the random number x;

a second hash processor for hashing the received document by the same method as that used by the first hash processor to obtain hashed data M;

a second subtractor for obtaining the difference, f(S)(mod n)−M, between the output M of the second hash processor and the output f(S)(mod n) of the third congruent polynomial operating unit;

a divider for dividing the output of the second subtractor by the output δ of the second δ-setting register;

a round-up operating unit for obtaining the smallest integer equal to or larger than the output of the divider;

a residue operating unit for performing a modulo-ϵ operation of the output of the round-up operating unit by the output ϵ of the second ϵ-setting register; and

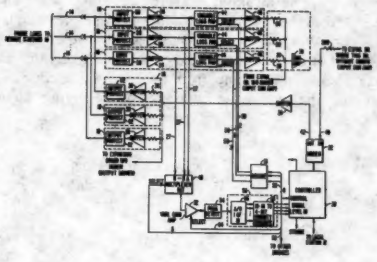
a circuit for deciding whether the output of the residue operating unit is zero or not and for outputting the decision result.

4,625,077

TELEPHONE BRIDGE METHOD AND APPARATUS

Lewis L. Biffle, Phoenix, and Chad R. Larson, Scottsdale, both of Ariz., assignors to International Anasazi, Inc., Phoenix, Ariz.

Filed Jul. 10, 1984, Ser. No. 629,325
Int. Cl.[4] H04M *11/00*; H04L *27/08*
U.S. Cl. 379—28 19 Claims



1. An improved apparatus for controlling communication between a local station and a plurality of remote stations, of the type wherein the local station supplies signals to a modem which distributes the signals over a plurality of phone lines and the modem receives signals from the plurality of phone lines and supplies the signals to the local station, the apparatus of the type including a plurality of input channels each of which is associated with one of the plurality of phone lines over which signals from each phone line are supplied to the modem, a plurality of output channels each of which is associated with one of the phone lines and over which the modem broadcasts its messages to the remote stations, and a controller for communicating with the modem and the remote stations to arbitrate access to the modem by the remote stations, the improvement comprising

level control means positioned in the signal path of each of the plurality of input channels for controlling the signal level of the signals being transmitted along the channels;

monitoring means coupled to each of the input channels for monitoring the level of the signals being transmitted along the channels; and

selecting means receiving the signal level information from the monitoring means and coupled to the level control means for selecting the level of the signals to be provided along the input channel signal paths so that the signals provided to the modem from the input channels are maintained within a desired range of signal levels, wherein the monitoring means comprise

channel selection means coupled to the selecting means and which receive the monitored signal from each of the input channels for supplying a selected one of the signals from the input channels;

means coupled to the channel selection means for measuring the signal level of the selected signal; and

means for supplying the measured signal level to the selecting means.

14. An apparatus for coupling a plurality of phone lines to a modem comprising

a plurality of input channels, each of which is coupled at one end to a different one of the phone lines and which are summed at the other end at a summing point;

a plurality of output channels, each of which is coupled at one end to a different one of the phone lines and which receive signals at the other end from the modem;

means for monitoring the level of the signals being transmitted along each input channel;

means positioned in the signal path of each input channel for modifying the level of the signals being transmitted along each input channel;

means coupled to the monitoring means and to the modify-

ing means for controlling the modifying means as a function of the signal levels measured by the monitoring so that the signal levels being supplied to the modem from the summing point fall within a predetermined signal level range;

means coupled to the summing point for detecting the presence of a carrier signal thereon;

means for generating a carrier tone; and

means receiving an input from the summing point and an input from the tone generator means and controlled by the carrier detection means, for supplying either the signal present at the summing point or the tone generator means in response to the signal from the carrier detection means, so that the modem is continuously receiving a carrier signal.

4,625,078

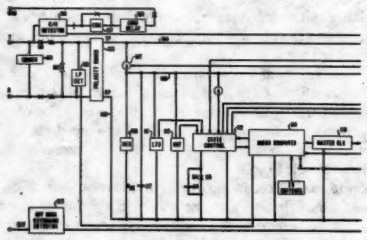
FRAUD PREVENTION IN AN ELECTRONIC COIN TELEPHONE SET

Paul E. Crouch, Freehold, N.J.; Joseph J. Nahas, Wyomissing Hills, Pa., and Howard Ng, Old Bridge, N.J., assignors to AT&T Technologies Inc. and AT&T Bell Laboratories, both of Murray Hill, N.J.

Filed Dec. 30, 1983, Ser. No. 567,053

Int. Cl.[4] H04M *17/02*

U.S. Cl. 379—145 **8 Claims**



1. A coin control arrangement for processing coins deposited in a coin telephone set line powered by a central office over a coin telephone subscriber loop, the arrangement comprising

first coin detecting means located at the beginning of a coin path in the telephone set for providing a signal indication once a coin has been deposited therein;

coin disciminating means located in the coin path for determining the material composition and denomination of the inserted coin; and

coin acceptance means operable in response to the coin discriminating means, the acceptance means diverting the coin from the coin path into a hopper only when the coin has been tested as good, the acceptance means further comprising a coin acceptor coil for operating a relay for diverting the coin from the coin path into the hopper, energy storage means connectable to the coin acceptor coil, a current source derived from the line power for charging the energy storage means to a predetermined voltage and switching means for transferring the energy stored in the energy storage means to the coin acceptor coil for operating the relay when the coin has been tested as good, the coin tested as bad continuing in the slot and exiting the telephone set.

4,625,079

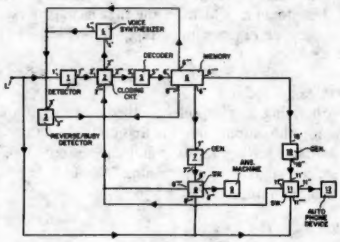
METHOD AND APPARATUS FOR ACTIVATING THROUGH PHONE TELECOMMAND AN ANNOUNCER-RECORDER, AND FOR SELECTIVELY ACTIVATING THROUGH THE SENDING OF CODES CONSISTING OF SIGNALS AT LEAST ANOTHER AUTOMATIC CALL ATTENTION PHONE DEVICE

Horacio Castro, and Marcelo Castro, both of El Salvador 5962, Buenos Aires 1414, Argentina

Continuation-in-part of Ser. No. 288,812, Jul. 31, 1981, Pat. No. 4,387,272. This application May 5, 1983, Ser. No. 491,812

Int. Cl.[4] H04M *1/64*

U.S. Cl. 379—77 **10 Claims**



1. Method for activating with a phone telecommand an announcer-recorder and for selectively activating by sending codes consisting of signals at least another automatic call attention phone device to provide remote control functions, wherein the method comprises the following steps:

(A) sending from the calling end of a phone line the characters corresponding to the called phone number;

(B) detecting at the called end of the phone line the call trains coming from the phone exchange;

(C) closing the d.c. current conversation circuit over the phone line and coupling thereto a voice synthesizer having a stored announcement therein inviting the calling party to send a certain code to leave a recorded message;

(D) after the calling party sends said certain code, decoding said certain code at the called party's end, and, if from a comparison with a code stored in the memory, both codes coincide, generating an artificial call trains designated to activate a phone answering machine;

(E) simultaneously sending to the calling party ring-back signals to advise that said certain code has been validated and that a phone answering machine is activated;

(F) after activation of said phone answering machine, the calling party emits a message over said circuit, which is recorded by said phone answering machine;

(G) simultaneous with the initiation of step F, sending a reset pulse to the phone telecommanded activation device, and,;

(H) after completion of step F, disconnecting the phone answering machine from the phone line.

4,625,080

REMOTE VIDEO RECORDER PROGRAMMING APPARATUS OPERATING OVER TELEPHONE LINES

Michael M. Scott, 965 New York Dr., Altadena, Calif. 91001

Filed May 3, 1983, Ser. No. 491,086

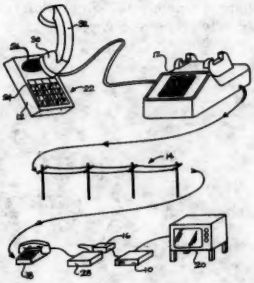
Int. Cl.[4] H04M *1/64, 11/00;* H04N *5/76*

U.S. Cl. 379—104 **4 Claims**

1. Apparatus for programming a video recorder comprising:

a programming unit locatable at a position remote from the video recorder, said programming unit including a keyboard for entering programming instructions, said instructions including a start time, a stop time and station whose program content is to be recorded by the video recorder, a visual display for prompting a user to enter said key-

board instructions and for displaying said instructions as they are entered, a memory device for storing digital signals corresponding to said instructions as they are input through said keyboard, a communications device for converting said digital signals corresponding to said instructions into serial signals suitable for telephone transmission, a transmit control for causing instructions stored in the memory means to be converted into said serial signals, and speaker means for converting said serial signals into audible tones suitable for transmission by a telephone system; and



a receiver unit, said receiver unit having means couplable to the telephone system for receiving said, audible tones, means for converting said audible tones into formated signals suitable for storage, means for storing said formated signals, processor means coupled to said means for storing and having means for interpreting said formated signals and converting them into video recording control signals, and interface means responsive to the processor means and couplable to a video recorder for controlling said recorder in accordance with said instructions by turning on said video recorder at the start time, turning off said video recorder at the stop time and tuning the recorder to an appropriate station.

4,625,081

AUTOMATED TELEPHONE VOICE SERVICE SYSTEM

Lawrence A. Lotito, 6625 Springpark Ave., Los Angeles, Calif. 90056; Teresa D. Huxford, 1822 Pandora Ave., #3, Los Angeles, Calif. 90025, and Ann L. Donaldson, 2321 W. 232nd St., Torrance, Calif. 90501

Filed Nov. 30, 1982, Ser. No. 445,651

Int. Cl.⁴ H04M *3/38, 3/50*

U.S. Cl. 379—88 **74 Claims**

33. The method of providing a telephone voice service system response to an incoming telephone call from a caller on a telephone line comprising the steps of:

communicating over the telephone line a prerecorded voice message prompting the caller to enter alternatively a message basket code or a personal identification code;

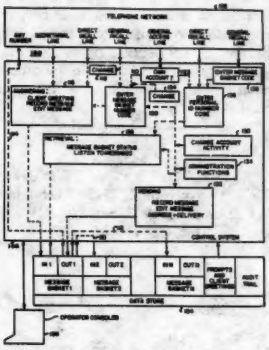
determining the type of code entered by the caller;

if a message basket code is entered, prompting the caller to communicate a voice message whose representation is forwarded to a message basket identified by the code and storing in a message basket portion of a store indicated by the message basket code a representation of any voice message communicated by the caller;

if a personal identification code is entered, enabling account ownership functions for an account associated with the personal identification code including retrieval of messages from a message basket associated with the account and forwarding of message representations from the associated message basket to another message basket identified by signals communicated over the telephone line in accordance with a predetermined code.

68. The method of providing a telephone voice service comprising the steps of:

answering incoming calls and accepting and responding to caller originated commands for voice message operation including commands to record or retrieve voice messages



or in the absence of receiving a caller originated command within a predetermined time period,

generating a voice message salutation which invites the caller to leave a voice message following a tone signal;

pausing after generating the saluation;

generating a tone after pausing; and

recording a representation of any voice message communicated after the tone is generated.

4,625,082

LOCAL AREA NETWORK COMMUNICATIONS SYSTEM FOR MAINTAINING SERVICE IN THE EVENT OF A FAULT

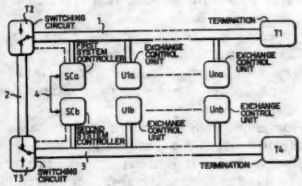
Michael B. Kelly, St. Albans, England, assignor to Standard Telephones & Cables Public Limited Co., London, England

Filed Jun. 4, 1984, Ser. No. 617,280

Claims priority, application United Kingdom, Jul. 15, 1983, 8319223

Int. Cl.⁴ H04B *3/46;* H04M *3/12*

U.S. Cl. 379—273 **4 Claims**



1. A communications system, comprising:

a number of served units, each of which is duplicated in the interests of system security such that for each such unit there is a first and a second unit, each said first unit corresponding to a respective different one of the second units;

a system controller also duplicated in the interests of system security such that there is a first system controller associated with said first units and a second system controller associated with said second units;

a local area network (LAN) interconnecting said units and said system controllers, said LAN including a first LAN section which interconnects said first system controller and all of said first units and a second LAN section which

interconnects said second system controller and all of said second units;

a link connected between the first system controller and the second system controller so that information as to operation effected by either one of said system controllers can be signalled to the other of said system controllers; and

first and second switching means associated respectively with the first and the second LAN sections and under the control respectively of the first and the second system controllers such that, if a LAN section is found by its system controller to be disturbed, the switching means for said disturbed LAN section operates to isolate the disturbed LAN section and to enable the other LAN section to maintain service to said units via the switching means of the other LAN section.

4,625,083

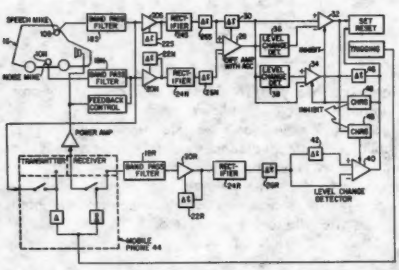
VOICE OPERATED SWITCH

Timo J. Poikela, Haavurintie 2, 25250 Märynummi, Finland

Filed Apr. 2, 1985, Ser. No. 718,950

Int. Cl.[4] H04M *1/60*

U.S. Cl. 379—389 **7 Claims**



4. A voice operated switch for use in loudspeaking telephone apparatus, said apparatus including a speech microphone, a noise microphone, and a receiving channel for receiving signals from a distant source, said switch comprising:

an independent speech amplifier for amplifying speech signals from said speech microphone;

an independent noise amplifier for amplifying noise signals from said noise microphone;

differential amplifier means for amplifying the difference between said speech and noise signals and for producing an output signal corresponding to said difference;

first detector means for generating a set control pulse when said output signal is rising;

second detector means for generating a set control pulse when said output signal is falling;

switch means for closing a transmitting circuit in response to set control pulses from said first and second detector means;

a receiving amplifier for amplifying a received signal; and

third detector means for generating a reset control pulse when said received signal is rising, said switch means being adapted to open said transmission circuit in response to a reset control pulse from said third detector means.

4,625,084

ROTARY SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

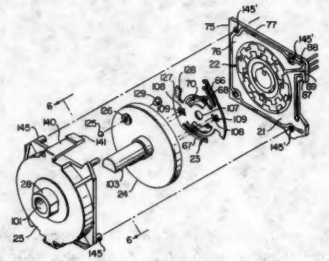
Daniel L. Fowler, Kentwood, Mich., and John W. Froeb, Riverside, Ill., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 29, 1984, Ser. No. 676,440

Int. Cl.[4] H01H *19/58*

U.S. Cl. 200—11 DA **20 Claims**

1. In a rotary switch construction comprising a surface means having a substantially circular electrically conductive code pattern thereon, an electrically conductive wiper contact means cooperating with said surface means for making contact with a selected part of said pattern, and a rotary selector operatively associated with said surface means and said wiper contact means for selecting the desired part of said pattern that is to be contacted by said wiper contact means, the improvement wherein said wiper contact means comprises a first pair of electrically connected wiper contacts disposed to respectively contact said pattern on a first substantially circular path thereof at points thereon that are disposed approximately 180° from each other, a second pair of electrically connected wiper contacts disposed to respectively contact said pattern on a second substantially circular path thereof at points thereon that are disposed approximately 180° from each other, and a third pair of electrically connected wiper contacts disposed to respectively contact said pattern on a third circular path thereof at points that are disposed approximately 180° from each other, said wiper contact means comprising a body portion, each wiper contact having opposed ends one of which is connected to said body portion and the other of which engages said code pattern, each wiper contact of the respective pair thereof extending from said body portion in a direction substantially opposite to the extending direction of the other wiper contact of that respective pair thereof, said other ends of said wiper contacts being substantially aligned on a diameter of said circular code pattern with one of the pairs of wiper contacts having each wiper contact thereof extending in a direction substantially opposite to the extending direction of said wiper contacts of the other pairs thereof that are disposed on the same side of said diameter of said circular code pattern therewith.



4,625,085

MATERIAL FOR HIGH FREQUENCY SUPPRESSION AND DISTRIBUTOR FOR COMBUSTION ENGINE COMPOSED OF THE SAME MATERIAL

Ichiro Yoshida, Kariya; Morihiro Atsumi; Shunzo Yamaguchi, both of Okazaki; Naotaka Nakamura, Chita, and Kenji Yagi, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 9, 1984, Ser. No. 639,204

Claims priority, application Japan, Aug. 19, 1983, 58-151805

Int. Cl.[4] H01H *19/00*

U.S. Cl. 200—19 R **4 Claims**

1. A distributor comprising:

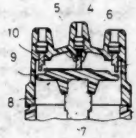
a center electrode;

a rotating electrode rotating in connection with said center electrode;

a plurality of fixed electrodes sequentially opposed to said rotating electrode to form a narrow gap therebetween and each electrically connected to each of an associated ignition plug;

wherein said distributor distributes a high voltage generated by an ignition coil to said ignition plugs via said center

electrode, said rotating electrode, and said fixed electrode through a spark discharge occurred at said narrow gap between said rotating electrode and one of said fixed electrodes; and wherein



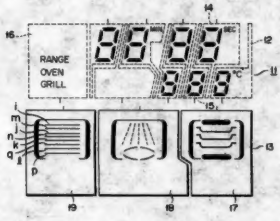
at least one of (a) said rotating electrode or (b) said plurality of fixed electrodes is composed of a sintered ceramic consisting essentially of a mixture of 45–90 mol % of zinc oxide (ZnO) and 55–10 mol % of ferrite.

4,625,086

COOKING APPARATUS CAPABLE OF DISPLAYING THE RATIO OF ELAPSED COOKING TIME TO PRE-SET TIME

Hisao Karino, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1985, Ser. No. 737,450
Claims priority, application Japan, May 29, 1984, 59-108806
Int. Cl.[4] H05B *6/68*
U.S. Cl. 219—10.55 B **9 Claims**



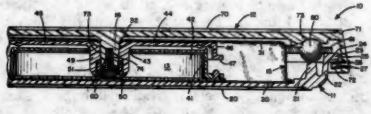
1. A cooking apparatus comprising:
a heating chamber having a means for thermal heating and a means for microwave heating;
cooking mode selecting means for selecting a cooking mode, said cooking mode including,
a thermal heating mode for cooking by said thermal heating means,
a microwave heating mode for cooking by said microwave heating means, and
a first sequential heating mode for cooking by both said thermal heating means and said microwave heating means;
cooking time setting means for setting at least one cooking time for said thermal heating mode, for said microwave heating mode and for said first sequential heating mode;
display means for displaying the ratio of elapsed time of said cooking time to said time set for said cooking mode, including,
a first group of display elements of a first color for displaying the ratio of elapsed time of said cooking time for said microwave heating mode, to said time set for said microwave heating mode, and
a second group of display elements of a second color for displaying the ratio of elapsed time of said cooking time set for said thermal heating mode, to said time set for said thermal heating mode, said second color being different from said first color
first control means for generating a heating control signal when said heating mode is selected by said cooking mode selecting means and said time set by said cooking time setting means, said first control means supplying the heating control signal to at least one of said thermal and microwave heating means; and
second control means for calculating the ratio of said elapsed cooking time to said time set by said cooking time setting means, and for generating a display control signal in accordance with said calculated ratio, said second control means supplying said display control signal to at least one of said first and second groups of display elements.

4,625,087

PORTABLE TURNTABLE FOR USE IN MICROWAVE OVENS

Jorgen A. Jorgensen, Bloomington; Donald W. Nygren, St. Louis Park; Douglas J. Kluge, Golden Valley, and Jerel P. Traun, Coon Rapids, all of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.

Filed Dec. 2, 1985, Ser. No. 803,156
Int. Cl.[4] H05B *6/80*; A47B *11/00*
U.S. Cl. 219—10.55 F **11 Claims**



1. A portable turntable for use in an oven comprising:
(a) a generally cylindrical base having a planar bottom, a cylindrical side wall projecting upwardly therefrom, and a ledge projecting outwardly from said cylindrical side wall, said ledge including at least one notch therein;
(b) a spring case secured to said planar bottom of said housing member, said spring case having a central opening of a predetermined diameter;
(c) a first gear member having gear teeth on the peripheral edge thereof and a central shaft having an opening therethrough projecting from a first major surface thereof, said shaft being journaled for rotation within said central opening in said spring case;
(d) a spiral power spring disposed in said spring case;
(e) means securing one end of said power spring to said spring case and means connecting the other end of said power spring to said central shaft;
(f) means for regulating the speed of rotation of said first gear member, said means cooperating with said gear teeth on said first gear member;
(g) a generally cylindrical turntable member having a generally planar top and bottom, an annular side wall projecting downwardly therefrom, at least one prong projecting inwardly from said cylindrical side wall, a central shaft projecting downwardly from said bottom of said turntable member, said shaft being journalled for rotation within the opening of the central shaft of the first gear member; and
(h) biasing means disposed between said spring case and said shafts for resiliently urging said turntable member away from said base to allow engagement of said prong with said notch.

4,625,088

CENTER WALL WITH SLOPED ENDS FOR A MICROWAVE HEAT APPLICATOR

Paul W. Gies, 92 Merriman Rd., Sewickley Heights, Pa. 15143

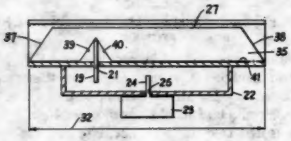
Filed Nov. 7, 1985, Ser. No. 795,786
Int. Cl.[4] H05B *6/72*
U.S. Cl. 219—10.55 A **11 Claims**

1. A microwave energy resonator device having particular utility for heating material by microwave energy with being

provided microwave energy from a microwave energy source, comprising:

housing means having a pair of side walls and a bottom wall and an upper wall forming an elongate rectangular configuration having two open ends, said upper wall having elongate slot formed therein dimensioned for receiving the material to be heated said slot extending the entire length of said upper wall;

partition wall means having a generally trapezoidal configuration with substantially parallel upper and lower wall edges and a pair of sloped end wall edges, said upper wall



edge having a length less than said lower wall edge, said lower wall edge having a portion affixed to the bottom wall of said housing such that said upper wall edge being supported proximate with said slot and recessed within said housing means;

whereby with said partition wall means being provided microwave energy an electric field will be produced about said upper wall edge with said electric field being terminated gradually about the sloped end wall edges for defining a heating zone about a portion of said slot being less than the entire length of said slot.

4,625,089

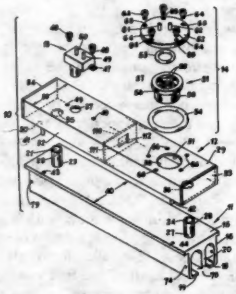
WATER LOAD CONTAINER DEVICE FOR A MICROWAVE HEAT APPLICATOR

Paul W. Gics, 92 Merriman Rd., Sewickley Heights, Pa. 15143

Filed Nov. 7, 1985, Ser. No. 795,785

Int. Cl.[4] H05B *6/76*

U.S. Cl. 219—10.55 R **6 Claims**



1. A fluid dummy load container device for being readily removably inserted into a portion of a waveguide member of a microwave heat applicator device for heat sealing thermoplastic food containing packagings, said waveguide member having wall portions defining a circular opening extending into an interior waveguide cavity, comprising:

a container means (51) being integrally formed to have a unitary structure and having a downwardly extending circular fluid receptacle member (55) and a circular upper ledge member (56), said receptacle member having a contoured interior wall surface defining a cavity (57, 91) with a varying diameter from a top end to a bottom end of said cavity, said receptacle member dimensioned for being received in the circular opening (38) of the waveguide (12), said container mean for being cantilever mounted to the waveguide with said receptacle member for projecting within the interior waveguide cavity (46) with said ledge member extending beyond and atop the exterior wall portions of the waveguide; and

cover means (52) formed of a suitable metal having a generally disk shape and dimensioned for being affixed to the waveguide and atop said upper ledge member, said cover means having a circular downwardly projecting ledge member (59) dimensioned for being received within a portion of said cavity, said downwardly projecting ledge member having a circumferential O-ring notch (60) mountingly receiving an O-ring gasket means (53), said O-ring gasket means being configured for providing a fluid seal between said container means and said cover means, said cover means having a fluid inlet port (61) and a fluid outlet port (62) to enable input and removal of a fluid load within said cavity; whereby a graduated fluid load effect is provided to a portion of the microwave energy within a portion of the waveguide.

4,625,090

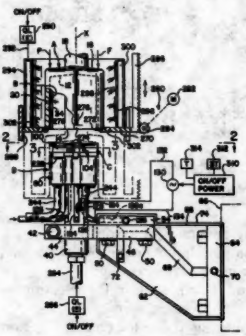
APPARATUS FOR INDUCTIVELY HEAT TREATING WORKPIECE BORE WALLS

George D. Pfaffmann, Farmington, Mich., and George M. Mucha, Parma Heights, Ohio, assignors to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Division of Ser. No. 615,225, May 30, 1984, Pat. No. 4,531,987. This application Apr. 4, 1985, Ser. No. 720,001

Int. Cl.[4] H05B *6/10*; C21D *1/18*

U.S. Cl. 219—10.57 **20 Claims**



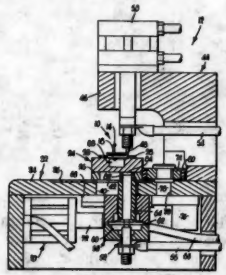
1. An inductor and quench head device for inductively heating and quench hardening the wall surface of an elongated bore of uniform selected cross-sectional shape throughout the axial extent thereof and extending axially within a metal workpiece and having an open end and a closed opposite end, said device comprising an insulating support member for passage upwardly into and axially of said bore, an inductor mounted on said support member adjacent the upper end thereof and comprising inductor element means having an outer shape generally matching the cross-sectional shape of said bore for inductively coupling with the wall surface thereof on the said passage of the support member and associated inductor upwardly into the bore, said device having primary quench outlet means located below and facing laterally outward of said inductor element means and secondary quench outlet means located above said inductor element means, and control means for initiating the supply of quench liquid to said secondary quench outlet means only after the said inductor, on its said upward passage into said bore, reaches its limiting innermost position therewithin.

4,625,091

METHOD AND APPARATUS FOR WELDING A COVER ON A CIRCUIT ENCLOSURE

Michael K. Smyers, Olathe, and Jack R. Kay, Overland Park, both of Kans., assignors to Polaris Electronics Corp., Olathe, Kans.

Filed Apr. 29, 1985, Ser. No. 728,604
Int. Cl.[4] B23K 11/32, 11/10
U.S. Cl. 219—86.24 20 Claims



1. Apparatus for welding a package of fusible material having a case and a cover to establish a hermetically sealed joint between the case and the cover, the cover having a marginal edge, said apparatus comprising:

a pair of reciprocable electrodes for supplying a welding current to the package;

an electrically conductive, shiftable carrier separate and independent from the electrodes for supporting the package between the electrodes;

first power means for reciprocating one of the electrodes into and out of engagement with the cover;

second power means for reciprocating the other electrode into and out of engagement with the carrier; and

third power means in the form of a driven roller for shifting the carrier at the completion of each weld cycle to relocate the package in position for the next succeeding weld cycle.

11. The method of resistance welding a package of fusible material having a case and a cover to provide a hermetically sealed joint between the case and the cover, the cover having a marginal edge, said method comprising the steps of:

placing the package on an electrically conductive carrier;

maintaining the carrier functionally separate from the electrodes;

successively shifting a pair of aligned electrodes capable of supplying a direct welding current until one of the electrodes presses against the cover at its marginal edge and the other electrode presses against the carrier;

effecting a weld cycle of controlled amplitude and duration during each such pressing engagement of the electrodes until a seam weld is established;

releasing said pressing engagements of the electrodes at the completion of each weld interval; and

indexing the carrier to relocate the package for the next succeeding weld cycle.

4,625,092

PLASMA ARC BULK AIR HEATING APPARATUS

David P. Camacho, and Salvador L. Camacho, both of Raleigh, N.C., assignors to Plasma Energy Corporation, Raleigh, N.C.

Filed Nov. 30, 1984, Ser. No. 676,657
Int. Cl.[4] B23K 15/00
U.S. Cl. 219—121 PM 12 Claims

1. A plasma are heating apparatus adapted for heating large quantities of a gas, such as air, for commercial or industrial uses, and comprising

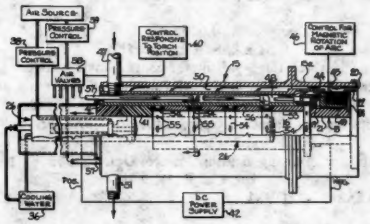
a support housing including an elongate heating chamber therein,

a tubular front electrode mounted at one end of said heating chamber and in axial alignment therewith,

a plasma arc torch mounted to said housing at the opposite end of said heating chamber and including a rear electrode, a collimating nozzle adjacent but spaced from said rear electrode, with said rear electrode and nozzle being axially aligned with said elongate heating chamber and said front electrode, and vortex generating means for generating a vortical flow of a gas at a location intermediate said rear electrode and said nozzle,

means mounting said front electrode and said plasma arc torch to said housing for selective relative movement axially toward and away from each other,

power supply means operatively connected to said rear electrode of said plasma arc torch and said front electrode for generating an arc which is adapted to extend axially



from said rear electrode through said vertical flow of gas and said nozzle and to said front electrode, and

means for introducing a variable amount of a gas to be heated into said heating chamber between said plasma arc torch and said front electrode, and such that the gas is heated by said arc and flows outwardly through said front electrode, said gas introducing means comprising a plurality of axially spaced apart rings of entry openings in said chamber, and a plurality of gas delivery lines connected to respective ones of said rings so that the openings of each ring receive gas from an individual one of said lines, and valve means for selectively opening and closing each of said gas delivery lines,

whereby the length of the arc, and thus the power available for heating the gas introduced into said heating chamber, may be varied by changing the axial separation between the torch and front electrode, and the temperature of the gas may be controlled by controlling the amount of the gas introduced into the heating chamber.

4,625,093

STOCK REMOVAL BY LASER CUTTING

George M. Chryssolouris, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

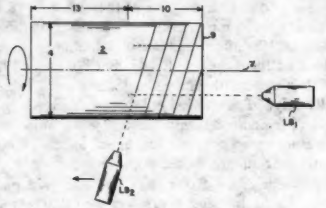
Continuation of Ser. No. 640,764, Aug. 14, 1984. This application Jan. 24, 1986, Ser. No. 822,915
Int. Cl.[4] B23K 26/00
U.S. Cl. 219—121 LJ 18 Claims

1. A method of removing stock from difficult to machine workpieces comprising:

directing a first laser beam at a first location on a workpiece and along a first axis to produce a first kerf,

directing a second laser beam at a second location on the workpiece which is spaced from the first location on the workpiece and along a second axis intersecting the first

axis to produce a second kerf intersecting the first kerf, and



effecting relative motion between the workpiece and the laser beams whereby the intersecting kerfs produce a separate, solid removable portion from the workpiece.

4,625,094

PLASMA TORCHES

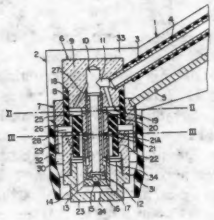
Gérard Marhic, Cergy; Didier Schaff, Auvers-sur-Oise, and Francis Remy, Montigny-les-Cormeilles, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Sep. 26, 1983, Ser. No. 535,880

Claims priority, application France, Oct. 1, 1982, 82 16512

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121 PM **22 Claims**



1. A plasma torch comprising: a nozzle carrier, an electrode carrier separate from said nozzle carrier but connected thereto, at least one of said carriers including an integral portion of uniformly expandable material, a gas feed pipe communicating with said electrode carrier, and dividing means for dividing gas from said pipe into a first flow of plasmagenic gas and into a second flow of cooling gas, said dividing means including a first series of cooling gas orifices and a second series of plasmagenic gas orifices, both said series of orifices being formed in the uniformly expandable material portion of said one carrier; said first series of orifices being spaced from said second series of orifices, said first series of orifices being part of a flow path for the cooling gas, said second series of orifices being part of a flow path for the plasmagenic gas, the flow path for the cooling gas being separate from the flow path for the plasmagenic gas.

4,625,095

METHOD OF WELDING METAL MATRIX COMPOSITES

K. Bhagwan Das, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 473,718, Mar. 8, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 743,175

Int. Cl.[4] B23K *9/23*

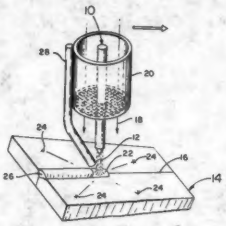
U.S. Cl. 219—137 WM **28 Claims**

1. A method of welding at least one metal matrix composite article to one or more other articles, comprising the steps of:

(a) defining a weld line with the articles;

(b) forming a molten pool of matrix metal on the weld line; and

(c) extending the molten pool along the weld line to form a weld while introducing a sufficient amount of fibrous



reinforcing material to the pool, in a portion of the pool where the metal is decreasing in temperature, to provide fiber reinforcement to the weld, the material comprising fibers that are compatible with the matrix metal when the matrix metal is in its molten state.

4,625,096

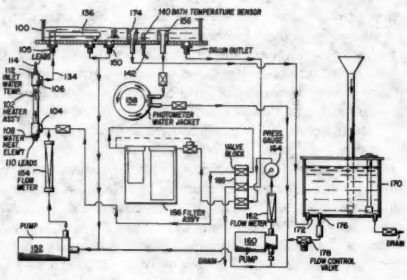
LIQUID BATH TEMPERATURE CONTROL

Taylor C. Fletcher, Fullerton, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 1, 1984, Ser. No. 656,756

Int. Cl.[4] H05B *1/02;* **F24H** *1/10;* **G01N** *35/02*

U.S. Cl. 219—331 **31 Claims**



1. A method of controlling the temperature of a liquid bath in a tank so that a desired constant liquid temperature is maintained substantially throughout said liquid bath, the bath liquid being subject to circulation into said tank at liquid inlet means on said tank and out of said tank at liquid outlet means on said tank, comprising the steps of:

setting the desired constant liquid temperature,

providing an energizable heating element externally of said tank and proximate said liquid inlet means, and arranging the heating element in heat transfer relation with the liquid entering said tank at said liquid inlet means,

measuring a first temperature of the entering liquid at a point downstream of the heating element upstream of the liquid inlet means,

determining the degree of imbalance between the measured first temperature and a preset liquid inlet temperature,

measuring a second temperature of the liquid at a point in the liquid bath in said tank remote from said liquid inlet means,

determining the degree of imbalance between the measured second temperature and the set desired constant liquid temperature,

producing deviation signals corresponding respectively to the degress of imbalance obtained in said two measuring steps,

obtaining a heating element drive signal by comparing the deviation signals with one another, and

energing the heating element in accordance with the heating element drive signal.

4,625,097

RICE COOKER

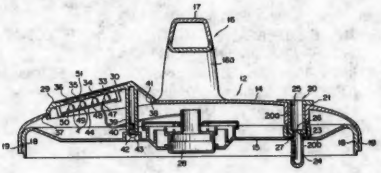
Yoshiyuki Miwa, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 23, 1984, Ser. No. 674,316

Claims priority, application Japan, Nov. 25, 1983, 58-182353[U]; Dec. 6, 1983, 58-188287[U]

Int. Cl.[4] F27D *11/02*

U.S. Cl. 219—441 10 Claims



1. A structural arrangement for a rice cooker comprising:

a main body having an upper opening;

a pot, arranged for placement in the main body, for containing therein water and rice to be cooked;

a lid pivotally mounted on the main body and having an inner lid plate for opening and closing the upper opening and an outer lid plate which is externally provided on and covering the inner lid plate and is engaged therewith; and

means for operating the rice cooker, having an operation panel fixed on the lid to face upward and a printed circuit board disposed in the lid and connected to the operation panel, said operation panel being fitted to the outer lid plate from outside thereof and engaged with the inner lid plate, thereby holding the outer and inner lid plates in an engaged state.

4,625,098

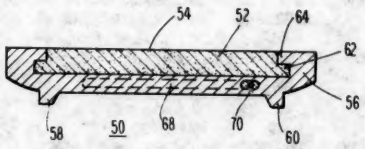
COOKWARE HAVING INTEGRALLY FORMED NATURAL STONE BOTTOMS AND METHOD OF MANUFACTURING THE SAME

Do S. Joe, 1150 Red Rose La., Villanova, Pa. 19085

Filed Oct. 16, 1984, Ser. No. 661,580

Int. Cl.[4] H05B *3/68*

U.S. Cl. 219—462 8 Claims



1. A food warming and serving utensil comprising:

a central body portion formed of natural stone having an upper surface for supporting and warming said food;

a metal base portion mechanically joined to and substantially surrounding said central body portion, except at said upper surface, the coefficient of thermal expansion of said metal base portion being substantially equal to the coefficient of thermal expansion of said central body portion, said metal base portion having at least one channel formed therein; and

heating means located in said channel means for maintaining the metal base portion and said central body portion at elevated temperatures.

4,625,099

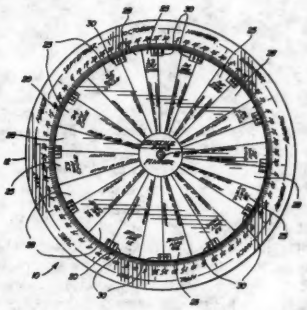
FERTILITY CALCULATOR

John Freedom, 17100 South Harlem Ave., Tinley Park, Ill. 60477

Filed May 20, 1985, Ser. No. 736,108

Int. Cl.[4] G06C *3/00*

U.S. Cl. 235—88 RC 5 Claims



1. A fertility calculator adapted to determine optimum monthly fertility time periods regardless of variations in menstrual cycle lengths, and calculated on the basis of ovulation occurring approximately fourteen days prior to the commencement of the next menstrual cycle, comprising in combination,

a first scale disc having the circumference thereof divided into 365 equal units, each unit representing a day in each month of a full calendar year,

a second scale disc being affixed to and positioned in rotatable operative relation to said first scale disc, said second scale disc including:

(a) a plurality of information segments formed thereon and being successively sized to correspond with a different menstrual cycle length calculated by the time period between the first day of successive menstrual cycles and ranging between 23 cycle days and 35 cycle days,

(b) each of said information segments being spaced from the next adjacent information segment by a spacer segment,

(c) each of said spacer segments being of equal size,

and each information segment further provided with an optimum fertility indicator segment formed thereon and sized in accordance with a time period equal to two days before and two days following ovulation,

whereby a particular optimum fertility time period may be determined by aligning the first determined day of a designated menstrual cycle length of the appropriate information segment of said second scale disc with the month and day of the occurrence of menstrual cycle on said first scale disc by rotating said second scale disc with respect to said first scale disc, thereby to align the optimum fertility indicator segment with a designated portion of said first scale disc to effectively determine the designated days of a particular month for the optimum fertility time period.

4,625,100

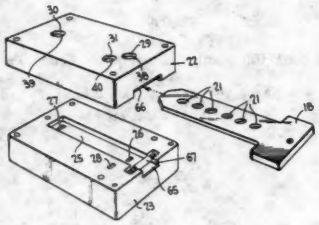
CODED DATA CARRIER AND READER AND ELECTRONIC SECURITY TOUR SYSTEM EMPLOYING SAME

Arthur E. Smith, Duluth, Ga., assignor to Lathem Time Recorder Co., Inc., Atlanta, Ga.

Filed May 9, 1984, Ser. No. 608,391

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—458 **36 Claims**



1. Apparatus for recording the attendance at and checking of plural mutually spaced station locations by a watchman, said apparatus comprising:

a plurality of coded data carriers located and secured at respective station locations, each data carrier comprising plural coded indicia uniquely identifying the station at which that data carrier is located;

a portable housing adapted to be carried to said station locations by said watchman and including passage means accessible by an access slot for permitting entry of individual data carriers into said passage means;

data reader means disposed in said portable housing for reading data from said data carriers in said passage means;

decoder means disposed in said portable housing and responsive to said data reader means for providing identification signals representing an identification of a coded data carrier which has been inserted into said passage means;

time-keeping means disposed in said portable housing for providing signals representing the time of day;

memory means disposed in said portable housing;

processing means disposed in said portable housing and responsive to said decoder means and said time-keeping means for storing in said memory means the identification and time of day of insertion into said passage means of each coded data carrier; and

printer means disposed in said portable housing for printing out in alphanumeric characters the information stored in said memory means representing inserted coded data carriers and time of day of insertion.

4,625,101

BAR CODE CONFIGURATION AND METHOD OF MOLDING

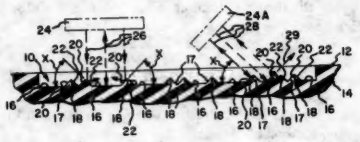
William L. Hinks, Akron, Ohio, and John R. Kinstler, Mason, Mich., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 27, 1984, Ser. No. 583,780

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—462 **23 Claims**

1. In a system having a light source and a receiving sensor for scanning a bar code configuration on the surface of said article comprising even surface portions and uneven surface portions for selectively reflecting light from said light source to said receiving sensor, said even surface portions reflecting substantially all light received from said light source in a first direction and said uneven surface portions including a sloped face positioned for reflecting light from said light source in a second direction different from said first direction and said light source and said receiving sensor being located generally in the same direction from said bar code configuration



whereby said light reflected to said receiving sensor defines bars of said bar code.

4,625,102

MEMORY CARD MANUFACTURING METHOD AND CARDS THUS OBTAINED

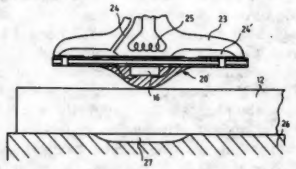
Alain Rebjock, Cergy, and René Rose, Voisins Le Bretonneaux, both of France, assignors to Flonic, Montrouge, France

Filed Jun. 7, 1984, Ser. No. 618,291

Claims priority, application France, Nov. 29, 1983, 83 18993; Jun. 9, 1984, 83 09558

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—492 **12 Claims**



1. A method of manufacturing a memory card of the type including a printed circuit embedded inside a sheet of plastic material constituting the support for the card, said method comprising the steps of:

(a) providing an electronic module which includes an insulating substrate equipped with metal-plated contact areas formed on a first side of said substrate, and mounting an electrical circuit on a second side of said substrate, said module having a thickness smaller than the thickness of said sheet;

(b) locally heating said plastic material to its softening temperature at the location at which said module is to be embedded; and

(c) simultaneously with step (b), applying pressure to said module on one side of said sheet at said location to embed said module in said plastic material until said electronic module is placed in the thickness of said sheet and said contact areas are substantially flush with said side of said sheet.

4,625,103

AUTOMATIC FOCUSING DEVICE IN MICROSCOPE SYSTEM

Goro Kitamura; Hidenori Horiuchi; Masaaki Aoyama, and Tokuhisa Ito, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,664

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 **6 Claims**

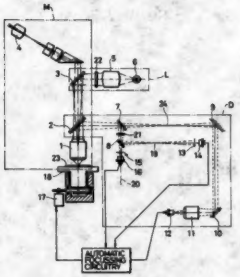
1. A focusing device, comprising:

a diverging light source;

an enlarging condenser lens receiving light from the light source;

a first half mirror disposed on a side of an enlarged image point of said light source, said side being opposite a side of said image point facing the condenser lens;

an objective receiving light from said first half mirror for illuminating a portion of a specimen to be focused;



a second half mirror for receiving light reflected from said specimen back through said objective from said first half mirror, thereby creating two half beams;

a first detector for receiving a first of said half beams, located beyond a focus point of said first half beam; and

a second detector for receiving a second of said half beams, located before a focus point of said second half beam.

4,625,104

DUAL SCAN OPTICAL PATTERN TRACER

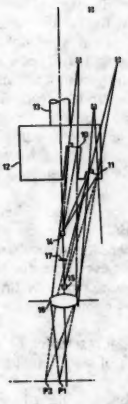
Robert E. Parker, Dundas, and Ronald J. Luker, Hamilton, both of Canada, assignors to Westinghouse Canada Inc., Hamilton, Canada

Filed Jun. 29, 1984, Ser. No. 626,221

Claims priority, application Canada, Aug. 26, 1983, 435492

Int. Cl.⁴ G05B *1/00*

U.S. Cl. 250—202 **6 Claims**



1. A circular scanning, non-steering optical pattern follower including a synchronously driven rotating mirror carrier, a first mirror mounted to one side of the axis of rotation of said carrier and with its surface at a small angle with reference to a plane perpendicular to said axis, a second mirror mounted to one side of the axis of rotation at a distance from the axis greater than that of said first mirror and with its surface at a small, but greater, angle with reference to said plane perpendicular to said axis than said first mirror, an illuminated pattern bearing surface, a first photo-sensitive device to receive light reflected from said pattern-bearing surface onto said first mirror, a second photo-sensitive device to receive light reflected from said pattern-bearing surface onto said second mirror, means to derive electrical signals from said first and second photo-sensitive devices and means to utilize said electrical signals to control the movement of said pattern follower.

4,625,105

ELECTRO-OPTIC CIRCUIT WITH SOURCE CONTROL FEEDBACK

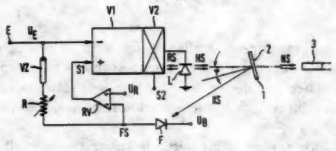
Christian Hentschel, Holzgerlingen, and Wolfgang Schmid, Stuttgart, both of Fed. Rep. of Germany, assignors to Hewlett-Packard GmbH, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,683

Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317027

Int. Cl.⁴ G01J *1/32*

U.S. Cl. 250—205 **11 Claims**



1. A circuit for the conversion of an electrical input signal into an optical output signal comprising:

a light-producing element;

a controllable amplifier having said electrical input signal as a first input, said controllable amplifier being connected to said light producing element; and

a feedback loop comprising:

(a) a light-detecting element positioned to receive a portion of the optical output of said light producing element and thereby to provide an error signal in response to said portion;

(b) an error amplifier connected to said light detecting element and having said error signal as an input; and

(c) a control signal coupled to said controllable amplifier as a second input, said control signal being an output signal of said error amplifier in response to said error signal; and

wherein said portion of the optical output of said light-producing element is taken from a main beam.

4,625,106

NONLINEAR GAIN MICROCHANNEL PLATE IMAGE INTENSIFIER TUBE

Edward J. Bender, Alexandria, Va.; E. Vincent Patrick, Laurel, Md., and Richard E. Franseen, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 29, 1984, Ser. No. 626,084

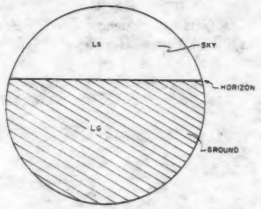
Int. Cl.⁴ H01J *31/50*

U.S. Cl. 250—213 VT **5 Claims**

1. A nonlinear gain microchannel plate image intensifier tube which provides varying amounts of amplification across scenes having large extremes of brightness, said tube comprising:

a microchannel plate havings its resistivity reduced and its linear electron gain increased by the same factor as the reduced resistivity to provide transfer characteristics comprised of fast decay rates of transient responses over predetermined input and output dynamic ranges, said microchannel plate having an input-output transfer function typical of microchannel plates in strip current saturation so that said transfer function is comprised of a low

input linear gain region, a middle nonlinear gain region with log input-log output slope less than unity to provide automatic image intensifier automatic brightness control, and a high input region asymptotically approaching unity gain, wherein each channel of said microchannel plate acts in the steady state case as an independent amplifier and its gain is determined solely by the input to that channel, said resistivity and linear gain of said microchannel plate are chosen so that the transfer is linear over a predetermined low input range and is nonlinear with log input-



log output slope less than unity over a predetermined middle input range wherein the resisitivity is low to obtain the desired fast decay rates for transient responses and the linear gain is high to meet predetermined intensifier gain; and

a phosphor screen having its phosphor transfer efficiency treated as a dependent variable of said intensifier tube wherein the value of said dependent variable is determined by the desired overall system gain and a chosen linear gain of said microchannel plate.

4,625,107

METHOD FOR CONTOUR RECOGNITION OF TOTALLY OR PARTLY TRANSPARENT OBJECTS, E.G., BOTTLES

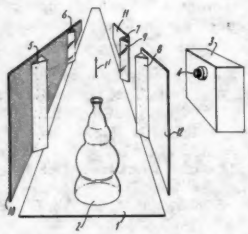
Tore Planke, Nykirke, Norway, assignor to A/S Tomra Systems, Asker, Norway

Filed Feb. 24, 1984, Ser. No. 583,251

Claims priority, application Norway, Feb. 24, 1983, 830648

Int. Cl.⁴ G01B *11/24*

U.S. Cl. 250—223 B **25 Claims**



1. In a method for contour recognition of at least partly transparent objects, comprising advancing the object through an illumination and detector section and illuminating the object over at least part of its circumferential area, the improvement comprising viewing the light reflected by the surface of said object against a dark background with the detector; viewing the light areas occurring at the exterior contour of said object; recording and converting said areas into pulse signals; and processing said pulse signals to yield a numerical code defining said object.

4,625,108

DEVICE FOR DETERMINING THE DIRECTION OF INCIDENT OPTICAL RADIATION

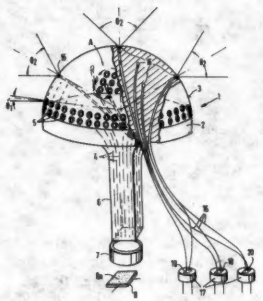
Siegfried Nestel, and Manfred Böhm, both of Stuttgart, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 28, 1983, Ser. No. 566,248

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300849

Int. Cl.⁴ G01B *11/26*

U.S. Cl. 250—227 **7 Claims**



1. An apparatus for passively determining direction of incident optic radiation comprising:

mounting means for providing a convex surface;

a plurality of optical fibers each having a first and second end, said first ends of said optical fibers disposed within said mounting means and apertured outwardly toward said convex surface, said plurality of optical fibers incoherently gathered into a bundle, said bundle of gathered optical fibers disposing said second ends of said plurality of optical fibers into a planar surface having a predetermined cross-sectional shape;

a detector matrix comprising a plurality of detector elements, the number of said detector elements being at least as great as the number of optical fibers included within said plurality of optical fibers, said second ends of said optical fibers and said plurality of detector elements of said detector matrix disposed with respect to each other in a nonaligned optically communicating relationship wherein optical radiation emitted from said second ends of said plurality of optical fibers is directed toward said plurality of detector elements comprising said detector matrix in a nonaligned mapping between said optical fibers on one hand and said detector elements of said detector matrix on the other;

allocator memory means for uniquely identifying said mapping between said optical fibers and said detector elements, said allocator memory means generating a unique address corresponding to each detector element and signifying a direction in space corresponding to that optical fiber which is in optical communication with said corresponding detector element;

summing network means for selectively determining said output intensity of each of said detector elements within said detector matrix;

an intensity memory means, having a plurality of memory locations, for selectively storing said intensity output corresponding to each detector element within said detector matrix within one of said plurality of memory locations within said intensity memory means according to said address generated by said allocator memory means, said intensity memory means being coupled to said allocator memory means and to said summing network means; and

evaluating circuit means coupled to said intensity memory

means for processing said intensity output stored within said intensity memory means and for generating an output corresponding to said direction of said incident optical radiation,

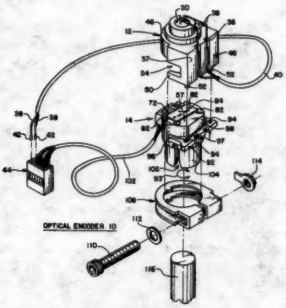
whereby said apparatus for passive optical radiation detection is provided without complex optical systems, without a plurality of individual optical detectors, without complex mechanical construction, and without large duplication of circuit elements.

4,625,109

OPTICAL ENCODER APPARATUS AND METHODS

Brian J. Nixon, Pleasanton, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Nov. 28, 1983, Ser. No. 555,591
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **23 Claims**



1. A method of manufacturing an optical encoder device including a scale, and a housing containing a light source, a photo transducer spaced apart from said light source and aligned for receiving a light beam therefrom, and a mask having opaque and translucent regions mounted over said transducer so that said opaque region shields said transducer from said light beam, said housing being mounted to a mounting post; said scale being positioned for relative movement between said source and said mask of said housing and having alternating opaque and translucent regions extending generally perpendicular to the locus of relative movement,

said method comprising the steps of:

(a) forming said housing of two parts, a cap and a receptor, said cap being formed to contain said light source and said receptor being formed to define a bore for engagingly fitting over a mounting post and to define a deck perpendicular to said bore for mounting said photo transducer and mask in alignment thereon,

(b) forming said cap with a mounting structure including mounting surfaces adapted for engaging corresponding mounting structure formed on said receptor;

(c) forming said receptor with a mounting structure for receiving said mounting surfaces of said cap in a secure aligned mounting relation thereon;

(d) assembling said cap by mounting said light source in said cap and connecting said light source to electrical connection means;

(e) assembling said receptor by mounting said transducer on said deck and connecting said transducer to electrical connection means and by mounting said mask on said deck in alignment with the axis of said bore;

(f) mounting said cap on said receptor to form said housing and so as to define a gap between said source and said deck for positioning said scale therein; and,

(g) mounting said housing in relation to said scale so that said scale is moveably positioned in said gap

(h) aligning said housing in relation to said scale by vertical and rotational adjustment of said housing relative to said mounting post;

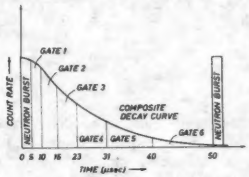
so that an encoder is manufactured wherein relative movement between said scale and said housing causes the transducer to put out an electrical value indicative of scale position and velocity relative to said housing.

4,625,110

EPITHERMAL NEUTRON POROSITY MEASUREMENT

Harry D. Smith, Jr., Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 24, 1983, Ser. No. 544,048
Int. Cl.[4] G01V *5/10*
U.S. Cl. 250—269 **16 Claims**



1. A method for determining the porosity of earth formations in the vicinity of a borehole passing therethrough, comprising the steps of:

(a) emitting, in a portion of the borehole substantially adjacent the formations of interest, repetitive pulses of fast neutrons for moderation to epithermal energies by interaction with nuclei of materials in the borehole and surrounding earth formations, creating thereby repetitive bursts of populations of epithermal neutrons in the borehole and surrounding earth formations, the borehole constituting a first zone and the surrounding earth formations a second zone,

(b) detecting epithermal neutrons at a longitudinally spaced distance in the borehole during at least four predetermined time intervals substantially spanning the time of the borehole moderation and the formation moderation of the fast neutrons, said detected epithermal neutrons thereby being representative of the epithermal neutron populations in both said zones,

(c) generating at least four count rate signals representative of said epithermal neutron populations during said at least four time intervals,

(d) combining said at least four count rate signals according to a predetermined relationship in which said signals are assumed to represent the sum of two substantially independent epithermal neutron populations, one in each zone, which populations decay exponentially with time at different rates, to obtain a measurement signal representative of the porosity of the surrounding earth formation, and

(e) recording said measurement signal as a function of borehole depth.

4,625,111

METHOD AND APPARATUS FOR PULSED NEUTRON CAPTURE MEASUREMENT OF BOREHOLE CONDITIONS AND FORMATION HYDROGEN INDEX

Harry D. Smith, Jr., Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

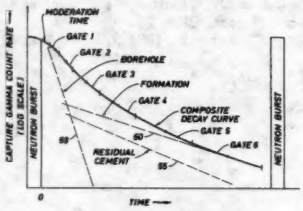
Filed Feb. 4, 1985, Ser. No. 698,045
Int. Cl.[4] G01V *5/10*
U.S. Cl. 250—270 **33 Claims**

1. A method for measuring the thermal neutron decay time of materials in and about a well borehole, comprising:

(a) generating, in the well borehole, a relatively short duration discrete burst of fast neutrons which are rapidly moderated by interaction with nuclei of materials in the

borehole and surrounding earth formations and slowed down to thermal energy, creating a thermal neutron population in the borehole and surrounding earth formations,

(b) detecting, in the borehole, radiations representative of the thermal neutron population in the borehole and surrounding earth formations, in at least two time intervals subsequent to said burst of fast neutrons, said at least two time intervals being chosen to maximize the borehole



component radiations relative to the formation component, and generating at least two count signals representative of said thermal neutron population during said at least two time intervals, and

(c) combining said count signals from said at least two borehole count maximizing time intervals according to a predetermined relationship to provide a measurement indicator representative of the thermal neutron decay time of the borehole medium.

4,625,112

TIME OF FLIGHT MASS SPECTROMETER

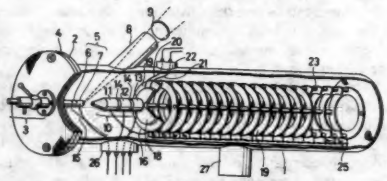
Yoshikazu Yoshida, Yawata, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Jun. 21, 1984, Ser. No. 622,845

Claims priority, application Japan, Nov. 30, 1983, 58-227393

Int. Cl.[4] B01D *59/44*

U.S. Cl. 250—287 **9 Claims**



1. A time of flight mass spectrometer comprising: an ion emitting means having a sample stage applied with a voltage and a radiating means for radiating pulse beams to a sample for generating ions therefrom, an analyzer tube having a plurality of ring-like electrodes secured at an equal interval from each other on the same axis of direction; means for applying a voltage Vn to each of said ring-like electrodes, said applied voltage Vn applied to an nth ring-like electrodge from said ion emitting means having a relationship with respect to the distance Xn from the ion emitting means to the nth ring-like electrode defined by the expression $Vn=a(Xn)^2+b(Xn)$, where a and b are constants represented by the expression $b=V_L/L-aL$, with L being the length of the analyzer tube and V_L being the voltage applied to the ring-like electrode at the rearmost end of the analyzer tube, with said voltage Vn for each of said other electrodes increasing in proportion to both said distance Xn and to the square of said distance Xn viewed from a common reference point on the side of said ion emitting means to said analyzer tube, and an ion detecting means disposed opposing to said analyzer tube for detecting ions turned back from the inside and getting out of the analyzer tube, whereby the detected ions emitted from said ion emitting means travels in said analyzer tube along U shaped flying passes.

4,625,113

MOTION DETECTOR HAVING SENSING MEANS WHICH DETERMINE THE SHAPE OF THE FIELD OF SENSITIVITY

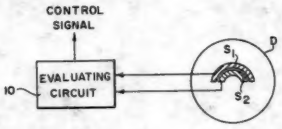
Hermann Zierhut, Munich, Fed. Rep. of Germany, assignor to Richard Hirschmann Radiotechnisches Werk, Esslingen am Neckar, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,756

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407426

Int. Cl.[4] G01P *13/00*

U.S. Cl. 250—338 **18 Claims**



1. A motion detector for controlling an object comprising:

sensing means for sensing radiation from a field of sensitivity at least partially surrounding and enclosing said object; and

an evaluating circuit responsive to said sensing means for generating a control signal in response to a change in the intensity of said radiation, said field of sensitivity having a shape which is determined by the shape of said sensing means.

4,625,114

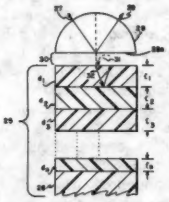
METHOD AND APPARATUS FOR NONDESTRUCTIVELY DETERMINING THE CHARACTERISTICS OF A MULTILAYER THIN FILM STRUCTURE

Bruno Bosacchi, Montgomery, and Robert C. Oehrle, Edgewater Park, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jul. 15, 1985, Ser. No. 755,029

Int. Cl.[4] G01N *21/41*; G01B *11/06*

U.S. Cl. 250—341 **11 Claims**



1. A method for nondestructively characterizing the layers of a multilayer thin film structure, comprising the steps of:

(a) directing a first beam of radiation into an optical coupler, having a base in contact with the surface of a multilayer thin film structure, at such an angle that the beam is reflected therefrom with an evanescent wave component passing from the coupler and coupling into the multilayer thin film structure as a real beam;

(b) reflecting the real beam from the layers of the thin film structure back into the coupler where it combines with the beam of radiation reflected from the base and exits the

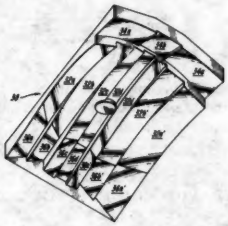
coupler with an intensity related to the characteristics of the structure layers;
(c) scanning the first beam into the coupler;
(d) detecting the intensity of the combined beams exiting the coupler during the scanning of the first beam; and
(e) comparing the detected reflectance intensity with the reflectance intensity of structures having known characteristics to determine the characteristics of the multilayer thin film structure.

4,625,115

CEILING MOUNTABLE PASSIVE INFRARED INTRUSION DETECTION SYSTEM

John K. Guscott, Lynnfield, Mass., assignor to American District Telegraph Company, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,308
Int. Cl.[4] G01J *5/08*
U.S. Cl. 250—353 **8 Claims**



1. A ceiling mountable passive infrared intrusion detection system, comprising:
a focusing mirror having an optical axis and a point focus;
a composite field-forming mirror defining an optical aperture and confronting the focusing mirror for deviating infrared energy present in the optical aperture of the field-forming mirror onto the focusing mirror;
an infrared detector positioned along the optical axis of the focusing mirror and at the point focus thereof for providing an electrical signal indication of intruder presence in response to infrared energy deviated thereto by the focusing mirror; and
said composite field-forming mirror having a first plurality of laterally adjacent and selectively-twisted cylindrical facets in strip-form that are individually cooperative with said focusing mirror for providing a corresponding one of a first plurality of partial vertical curtains in selected azimuthal spacing that are each comparatively wide in elevation and comparatively narrow in azimuth, with individual ones of the selectively-twisted cylindrical facets having a cylindrical axis that intersects the optical axis of the focusing mirror at a preselected different non-zero acute angle.

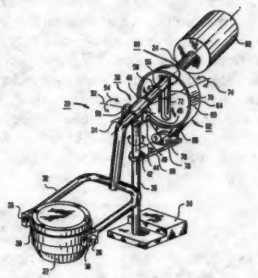
4,625,116

STRUCTURE FOR SUPPORTING A DETECTOR HEAD

George J. Hanz, Bloomingdale, Ill.; Guenter Jung, Roettenbach, and Michael Pflaum, Aisch, both of Fed. Rep. of Germany, assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Mar. 29, 1985, Ser. No. 717,763
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—363 S **14 Claims**

1. Structure for supporting a detector head, comprising
(a) an arm having a distal end supporting the head and having a longitudinal arm axis;
(b) a base;
(c) a joint mounted on the base and moveably supporting the arm;
(d) a slotted member rotatably mounted to the base at a predetermined distance from the joint, said slotted member including means for mounting the arm in the guidance slot at a predetermined distance from the rotational axis in a manner that the arm is freely slidable along its longitudinal arm axis, and is non-rotatably fixed with respect to the guidance slot; and



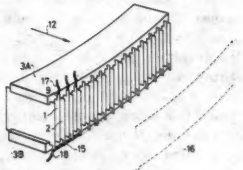
(e) means connected between base and slotted member for rotating the slotted member about its rotational axis.

4,625,117

MULTI-CELL RADIATION DETECTOR

Takayuki Hayakawa, Hachioji; Manabu Nakagawa, Tsukui; Hideji Fujii, Nishitama, and Shigeru Sato, Kitasouma, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,738
Claims priority, application Japan, Jul. 30, 1983, 58-140109
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—385 **6 Claims**



1. A multi-cell radiation detector comprising:
a vessel containing ionizable gas enclosed therein and provided at its front surface with a radiation transmissive window;
an electrode section fixedly inserted in respective grooves formed in a pair of insulated grooved electrode holding plates so as to be fixed inside said vessel in a traveling path of the radiation from said radiation transmissive window, and having a first group of electrode plates to which high voltage is applied and a second group of electrode plates from which signals are obtained, said electrode plates in both groups being arranged alternately to delimit a plurality of individual cells; and
means for restraining variation in sensitivities caused by residual currents among the individual cells of the multicell radiation detector, said variation restraining means including first terminals associated with said first group of electrode plates and to which first lead means for introducing high voltage from the exterior of said vessel are connected, said first terminals being disposed proximate to rear edges of said first group of electrode plates, said rear edges being those edges disposed farthest away from said radiation transmissive window, and second terminals

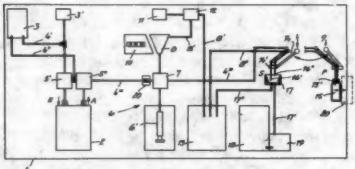
associated with said second group of electrode plates and to which second lead means for individually leading out signal outputs to the exterior of said vessel are connected, said second terminals being disposed proximate to rear edges of said second group of electrode plates, said rear edges being those edges disposed farthest away from said radiation transmissive window, said first and second terminals respectively projecting one of upwardly and downwardly from edges of said first and second group of electrode plates extending transversely to the rear edge of said first and second group of electrode plates at positions spaced from one another and offset from said travelling path of the radiation so that said travelling path of the radiation is located therebetween.

4,625,118

DEVICE FOR THE ELUTION AND METERING OF A RADIOACTIVE NUCLIDE

Gert Kriwetz, Graz, and Karl Gärtner, Hall, both of Austria, assignors to Bender + Co. Gesellschaft mbH, Vienna, Austria

Filed Aug. 15, 1984, Ser. No. 640,965
Claims priority, application Austria, Aug. 17, 1983, 2948/83
Int. Cl.[4] G21G *4/00*
U.S. Cl. 250—432 PD **3 Claims**



1. A device for the elution and metering of a radioactive nuclide such as technetium, said device comprising a radiation-proof housing, said housing containing a nuclide generator having an inlet and an outlet, a first stock vessel for a liquid nuclide solvent, a second stock vessel for containing an eluate, a measuring instrument for measuring the radiation activity of the eluate in said second stock vessel, a mechanism for connecting said first stock vessel to said generator inlet, an aspiration and metering device for the eluate, a mechanism for connecting said first stock vessel and said generator outlet to said aspiration and metering device, a filling station, said aspiration and metering device being connected to said filling station in which the eluate is filled into an ampoule-like vessel, a controllable multi-way valve, a waste container, and a flushing and disinfecting station associated with said filling station and wherein said aspiration and metering device has an aspiration syringe, said syringe being connectable via said controllable multi-way valve to said second stock vessel, said aspiration and metering device and said flushing and disinfecting station associated with said filling station being connected to said waste container.

4,625,119

SANITIZER FOR BATHROOM ARTICLES

James O. Murdock, III, 207 Edgewood Dr., West Palm Beach, Fla. 33405

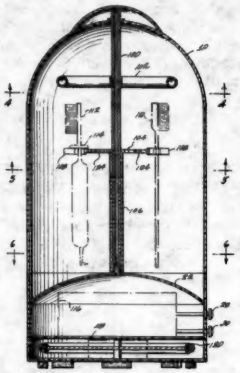
Filed Apr. 10, 1985, Ser. No. 721,659
Int. Cl.[4] A61L *2/10*
U.S. Cl. 250—455.1 **18 Claims**

1. A sanitizer for bathroom articles, comprising:

a closeable housing;

storing means for storing at least one bathroom article in said housing;

sanitizing means for sanitizing the stored bathroom article; and



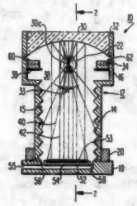
drainage means for venting by the force of gravity drainage fluid from the interior of said housing through a peripheral base portion of said housing.

4,625,120

DEEP ULTRAVIOLET (DUV) FLOOD EXPOSURE SYSTEM

Fausto Caprari, East Brunswick, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,245
Int. Cl.[4] H01L *21/26*
U.S. Cl. 250—492.1 **10 Claims**



1. Apparatus for flood exposing a substrate with deep ultraviolet (DUV) radiation, said apparatus having means for positioning a mask to provide an image on the surface of the substrate, and further comprising:

(a) a reflector comprising a portion of a spherical surface and having an optical axis and a focal point;

(b) means for providing a pulse of radiation including a tubular xenon lamp;

(c) said lamp being positioned at the focal point of said reflector to provide a composite beam of radiation comprising a direct beam and a beam reflected from said spherical surface;

(d) means including a cylindrical baffle positioned with the longitudinal axis of said baffle coincident with the optical axis of said reflector and having a diameter larger than the substrate diameter and having a length extending substantially between said lamp and said substrate for preventing uncollimated radiation directly from said lamp mixing with said collimated beam, to thereby prevent uncollimated light from striking said substrate; and

(e) means for positioning said substrate in the path of said radiation beam for receiving an image from said mask on the surface of said substrate;

whereby a substantially collimated beam of pulsed deep ultraviolet radiation formed of a direct beam from said lamp and a reflected beam from said spherical surface is passed through said mask and is directed through and parallel to the axis of said baffle to image said substrate.

4,625,121

METHOD OF ELECTRON BEAM EXPOSURE

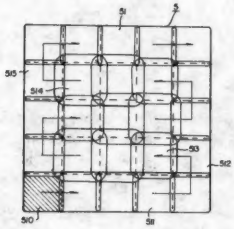
Shin-ichi Hamaguchi, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 22, 1985, Ser. No. 704,515

Claims priority, application Japan, Feb. 29, 1984, 59-37934

Int. Cl.[4] H01J *37/30*

U.S. Cl. 250—492.2 **8 Claims**



1. A method for energy beam exposure of an island-like pattern including a region to be exposed to said energy beam which is surrounded by an unexposed region, said method comprising the step of:

providing sequentially intermitent shots of said energy beam to a plurality of sub-regions at the periphery and the inner portion of said island-like pattern defined by subdividing said island-like pattern, said step including the following steps;

subjecting said sub-regions at the periphery of said island-like pattern to a shot with a first blanking pause after a preceding shot, and

subjecting said sub-regions at the inner portion of said island-like pattern to a shot with a second blanking pause shorter than said first blanking pause after a preceding shot.

4,625,122

DEVICE FOR THE HANDLING AND PROTECTION OF CANISTERS FOR STORING RADIOACTIVE MATERIALS

Werner Botzem, Alzenau, and Heinrich Quillmann, Nidderau, both of Fed. Rep. of Germany, assignors to NUKEM GmbH, Hanau, Fed. Rep. of Germany

Filed Jun. 15, 1984, Ser. No. 621,290

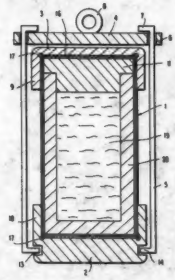
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322770

Int. Cl.[4] G21F *5/00*

U.S. Cl. 250—506.1 **14 Claims**

1. A device for the handling and protection of a canister for storing radioactive materials comprising a bottom edge guard cap (2) and a top edge guard cap (3), said bottom edge guard cap and top edge guard cap encasing the respective bottom and top edge of said canister to thereby protect the top edge and the bottom edge from damage and to prevent breakage of the canister and leakage of the contents from the canister,

said bottom edge guard cap being retained by at least two elongated lifting bars (5) having a top end and a lower end, said lower end being adapted to engage with said bottom edge guard cap, the bottom edge guard cap having a recess formed in the side walls thereof to receive the lower end of said elongated lifting bar, said lifting bars being fitted into a lifting plate (4) which is positioned over and above the top edge guard cap and separated therefrom, said lifting plate (4) being provided with supporting means (8) for hoisting device, said lifting bars having at



their top ends means (7) for the locking and releasing of said lifting bars with said bottom edge cap.

4,625,123

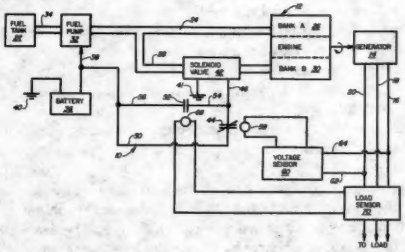
LOAD SENSITIVE FUEL CUTOFF AND METHOD TO INCREASE ENGINE STABILITY

Daniel D. Gillett, Brooklyn Park, and Raymond Stacherski, Anoka, both of Minn., assignors to Onan Corporation, Minneapolis, Minn.

Filed Sep. 24, 1984, Ser. No. 654,631

Int. Cl.[4] H02P *9/04*

U.S. Cl. 290—40 B **17 Claims**



1. A load sensitive fuel cutoff for at least one cylinder in a multi-cylinder engine included in an engine-generator set, said engine-generator set including said engine, a generator and a fuel supply, comprising:

first means communicating a first group of said cylinders to said fuel supply,

second means communicating a second group of said cylinders to said fuel supply,

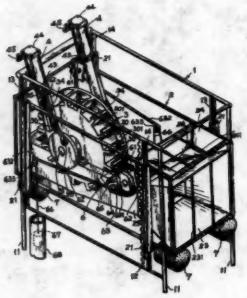
a fuel flow control valve in said second communicating means, and

means for sensing load on said engine, said load sensing means operable to actuate said flow control valve to close communication of said fuel supply to said second group of cylinders upon said load dropping to a first predetermined level and opening communication upon said load being above a second predetermined level.

4,625,124
SEA WAVE IMPACTED POWER GENERATING DEVICE

Wu Ching-An, P.O. Box 10160, Taipei, Taiwan

Filed Nov. 13, 1984, Ser. No. 671,163
Int. Cl.[4] F03B *13/12*
U.S. Cl. 290—42 3 Claims



1. A power generating device using the impact forces of sea waves comprising:

a fixed support having support rods, the bottoms of which are fixed to a shallow sea bed;

a movable bearer slidably mounted on the fixed support with a square type horn port provided at the front end face and a protion of the upper face;

a blade type water wheel located at an outlet connected to the square type horn port of said movable bearer;

two pressure cylinders, used to generate high pressure air, operated by connecting rods eccentrically mounted to the blade type water wheel;

a storage cylinder for storing high pressure air compressed by said pressure cylinders;

braking means provided at each side of the movable bearer to slow any sudden movement of the entire movable bearer in a vertical direction;

several floating bodies mounted at the bottom of the movable bearer; characterized in that:

the fixed support has toothed strips mounted vertically at both sides, with dovetail strips connected to the rear of the toothed strips;

the movable bearer has dovetail channel rods corresponding to and slidably matching the dovetail strips on the fixed support;

the square type horn port has a water channel connected thereto for guiding sea water to the water wheel;

the blade type water wheel has a shaft rotatably connected to the movable bearer by a bearing and a seat, a round disk attached to both ends of the shaft, the disks having a pin eccentrically inserted at an external portion thereof, said pin being pivotally connected to one end of a connecting rod, the other end of the connecting rod being pivotally connected to a piston rod of the pressure cylinder;

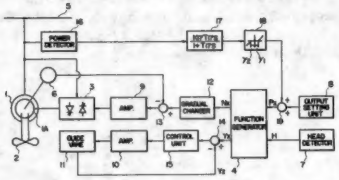
each braking means consists of a gear engaging the toothed strip on the fixed support, a braking disk attached to the gear, and a braking rod, one end of the rod being adjacent to the braking disc for applying a retarding force, the other end being connected to and movable by a line attached to a weight in a guide cylinder;

the floating bodies mounted at the bottom of the movable bearer maintain the bearer on the water surface enabling the horn port to accept the impact of the sea waves thus turning the water wheel and operating the pressure cylinders to generate high pressure air to be used in a power or electric generating device.

4,625,125
METHOD AND APPARATUS FOR CONTROLLING VARIABLE-SPEED HYDRAULIC POWER GENERATING SYSTEM

Takao Kuwabara, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,436
Claims priority, application Japan, Oct. 26, 1983, 58-199041
Int. Cl.[4] F01B *25/02*
U.S. Cl. 290—52 3 Claims

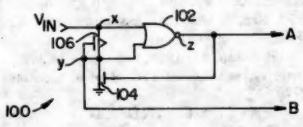


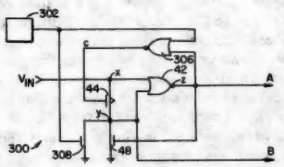
1. A method of controlling a variable-speed hydraulic power generation system comprising an induction generator having an excitation secondary winding, a hydraulic machine connected to said induction generator for driving the same, guide vane means for controlling the quantity of water supplied to said hydraulic machine, a frequency converter for applying an AC excitation to the secondary winding of said induction generator thereby to maintain the output frequency thereof at constant level, and a control unit for changing the quantity of water by controlling said guide vane means on one hand and for changing the amount of excitation by controlling said frequency converter on the other hand, said method comprising the steps of detecting variation is any one of the frequency of a power system electrically connected to said power generation system and a power demand from said power system to said power generation system and controlling said guide vane means by said control unit based on the detected variation so as to dampen said variation.

4,625,126
CLOCK GENERATOR FOR PROVIDING NON-OVERLAPPING CLOCK SIGNALS

Darrell E. Tinker, Mountainview, and Shyam Dujari, San Jose, both of Calif., assignors to Zilog, Inc., Campbell, Calif.

Filed Jun. 29, 1984, Ser. No. 626,378
Int. Cl.[4] H03K *5/05, 5/15, 5/26, 17/13*
U.S. Cl. 307—262 1 Claim





1. A circuit responsive to a variable input signal for producing a first and a second output signal that vary respectively with phases opposite to and the same as said input signal,

wherein the second output signal is inhibited by a control signal, said circuit comprising:

a first NOR-gate with a first input connected to the variable signal input and a second input to the second signal output of the circuit, the output of said NOR-gate supplying the first signal output of the circuit;

a first enhancement type FET whose gate is supplied with the first output signal of the circuit, the main current path of said enhancement type FET connected between said second signal output of the circuit and ground;

a depletion type FET whose main current path is connected between the variable input signal and the second signal output of the circuit;

a second NOR-gate with its two inputs connected to the first output of the circuit and the control signal and its output applied to the gate of the depletion type FET; and

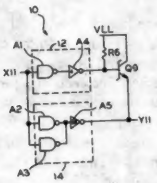
a second enhancement, type FET with its main current path connected between the second output of the circuit and ground and its gate controlled by the control signal.

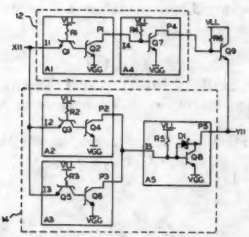
4,625,127

HIGH-FANOUT CLOCK DRIVER FOR LOW LEVEL GATES

Gil S. Lee, San Jose, and Ashok Kumar, Saratoga, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 6, 1984, Ser. No. 638,094
Int. Cl.[4] H03K *19/20, 17/12, 19/088*
U.S. Cl. 307—270 **20 Claims**





1. A clock driver circuit for low level gates which provides high fanout capabilities, said driver circuit comprising:

a first circuit portion formed of a first NAND logic gate and a first inverter gate, the input node of said first inverter gate being coupled to the output node of said first NAND gate, the input of said first NAND gate being connected to an input circuit terminal;

a second circuit portion formed of a second NAND logic gate, a third NAND logic gate and a second inverter gate, the input nodes of said second and third NAND gates being coupled together and to the input circuit terminal, the output nodes of said second and third NAND gates being coupled together and to the input node of said second inverter gate, the output node of said second inverter gate being connected to an output circuit terminal;

an output transistor having its base coupled to the output node of said first inverter gate, its collector coupled to a voltage supply potential and its emitter coupled to the output circuit terminal; and

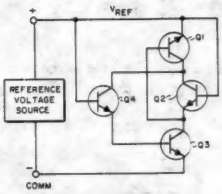
a load resistor having one end connected to the base of said output transistor and its other end connected to the voltage supply potential.

4,625,128

INTEGRATED CIRCUIT TEMPERATURE SENSOR

Eduard F. B. Boeckmann, Huntsville, Ala., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Sep. 23, 1985, Ser. No. 779,004
Int. Cl.[4] H03K *3/26;* **G01K** *7/00*
U.S. Cl. 307—310 **7 Claims**



1. A circuit for sensing environmental temperature changes comprising:

first, second, third and fourth transistors, each including base, emitter and collector electrodes;

a source of reference voltage including positive and common output terminals;

said first transistor emitter, said second transistor base and said fourth transistor base all connected to said reference voltage positive terminal;

the collectors of said first, second and fourth transistors all connected together;

said first transistor base and said second transistor emitter both connected to said third transistor collector;

said fourth transistor emitter connected to said third transistor base; and

said third transistor emitter connected to said reference voltage common terminal;

said circuit operated in response to environmental temperature changes to vary the current flow through said third transistor proportionate to said temperature changes.

4,625,129

ELECTRONIC CIRCUIT DEVICE HAVING A POWER SUPPLY LEVEL SWITCHING CIRCUIT

Kouji Ueno, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 26, 1983, Ser. No. 536,000
Claims priority, application Japan, Sep. 30, 1982, 57-169544
Int. Cl.[4] H03K *19/086, 19/088*
U.S. Cl. 307—446 **18 Claims**

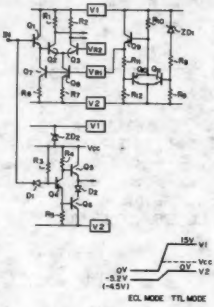
1. An electronic circuit device receiving a power source voltage having a level, comprising:

circuit portions including first and second groups, the first group requiring a first power supply level and the second group requiring a second power supply level different from the first power supply level;

first and second power terminals, operatively connected to all of the circuit portions, receiving the power source voltage thereacross; and

control means, operatively connected to said circuit portions

and said first and second power terminals for activating one of the first and second groups of said circuit portions



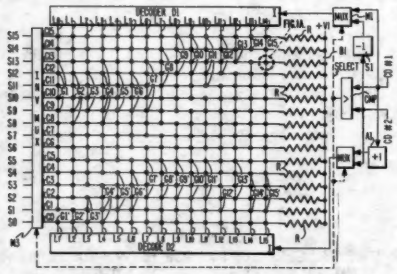
in dependence upon the level of the power source voltage applied to said power terminals.

4,625,130

MASK SIGNAL GENERATOR

Lance R. Murray, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 30, 1984, Ser. No. 615,266
Int. Cl.[4] H03K *19/177*
U.S. Cl. 307—468 **10 Claims**



1. A signal generator comprised of:

a plurality of conductors numbered 0 thru N respectively for carrying output signals thereon;

each of said conductors being coupled through a respective resistive means to a first voltage bus;

first, second, third, . . . , N groups of transistors of a first set which respectively couple said conductors 1 thru N, 2 thru N, 3 thru N, . . . , N to a second voltage bus;

first, second, third, . . . , N groups of transistors of a second set which respectively couple said conductors 0, 0 thru 1, 0 thru 2, . . . , 0 thru N−1 to said second voltage bus; and

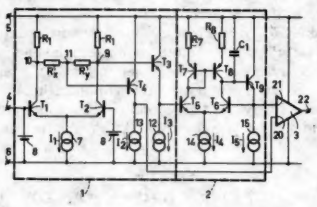
means for receiving input signals, and in response thereto, for turning on said transistors of a selectable group of said first set and a selectable group of said second set to thereby generate said output signals on said conductors.

4,625,131

ATTENUATOR CIRCUIT

Wolfdietrich G. Kasperkovitz, and Dirk J. Dullemond, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1984, Ser. No. 590,095
Claims priority, application Netherlands, Mar. 31, 1983, 8301139
Int. Cl.[4] H03K *5/08*
U.S. Cl. 307—540 **5 Claims**



1. A circuit for providing an attenuated electric signal and an unattenuated reference signal with related d.c. reference levels comprising:

first and second transistors connected to provide differential currents from a common current source, one of said transistors connected to receive an input electric signal to be attenuated;

first and second load impedances connected to each of said transistors for providing a return path for said differential currents through a connected voltage source;

a voltage divider connected between the junctions of said load impedances and transistors, said voltage divider having a common tap; and

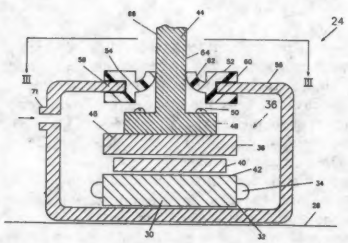
third and fourth current amplifiers connected to said tap and one of said voltage divider ends, said current amplifiers providing said attenuated signal proportional to said input electric signal and said unattenuated signal proportional to said input electric signal, said attenuated and unattenuated signals having d.c. levels which are substantially equal.

4,625,132

LINEAR MOTOR WITH SEAL

Anwar Chitayat, Northport, N.Y., assignor to Anorad, Hauppauge, N.Y.

Filed Aug. 7, 1984, Ser. No. 638,488
Int. Cl.[4] H02K *41/02*
U.S. Cl. 310—13 **14 Claims**



1. A linear motor comprising:

a linear stator;

a U-shaped channel contained in said linear stator;

a movable element linearly movable within said channel substantially parallel to said linear stator;

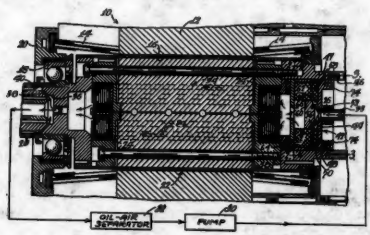
connecting means for connecting said movable element to a load external to said U-shaped channel;
sealing means for sealing an opening between first and second arms of said U-shaped channel;
said sealing means including a first seal affixed to said first arm and a second seal affixed to said second arm;
said first and second seals including first and second flexible sealing portions respectively;
said first and second flexible sealing portions including substantially abutting portions effective for forming a seal therebetween; and
said sealing means including means for permitting said connecting means to pass between said first and second flexible sealing portions whereby environmental contaminants are substantially excluded from an interior of said U-shaped channel.

4,625,133

ROTARY ELECTRIC MACHINE WITH CENTRIFUGAL FILTER

James L. Lobsinger, and Jerry D. Wefel, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1983, Ser. No. 565,643
Int. Cl.[4] H02K *9/26*
U.S. Cl. 310—56 **11 Claims**



1. In a rotary electric machine, the combination of:
a stator;
a rotor journalled for rotation relative to the stator about an axis of rotation;
electric windings carried by said rotor;
means defining a fluid coolant flow path through said rotor in heat exchange relation with said winding whereby the windings and the rotor may be cooled;
a fluid coolant inlet on said rotor; and
a centrifugal filter carried by said rotor and interposed in fluid flow relation between said flow path and said inlet.

4,625,134

MEANS FOR MOUNTING A GEAR TRAIN AND MOTOR

Robert F. Weaver, Brownsburg, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Mar. 25, 1985, Ser. No. 715,976
Int. Cl.[4] H02K *7/06*
U.S. Cl. 310—83 **1 Claim**

1. A motor and gear train assembly comprising
(a) a gear train enclosed in a housing and keyhole shaped apertures spaced around the periphery of said housing,
(b) a motor carried on said housing, and
(c) a cradle holding said motor on said housing, said cradle including a base and legs extending therefrom,
(d) each of said legs having locking means extending from distal ends of said legs to hold said cradle and said motor on said housing comprising a tab extending from said distal ends through said keyhole apertures and engaging an underside of said housing and a spring tab extending

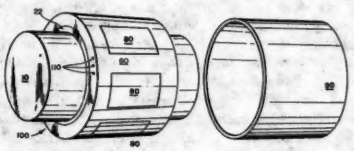
from said distal ends and engaging an edge of said housing formed by said keyhole apertures.

4,625,135

PERMANENT MAGNET ROTOR

George Kasabian, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 515,331, Jul. 19, 1983. This application Jun. 19, 1985, Ser. No. 746,418
Int. Cl.[4] H02K *21/12*
U.S. Cl. 310—156 **9 Claims**



1. A permanent magnet rotor, comprising:
a shaft of magnetizable material;
a layer of non-magnetizable material formed around the periphery of said shaft, said layer having a first plurality of apertures therein disposed circumferentially about said rotor with each of said apertures extending radially inwardly through said layer to said shaft;
a first plurality of rare earth permanent magnets, each of said magnets fitting into one of said apertures in a manner whereby the sides of each of said magnets are surrounded by said layer, said layer thereby acting as a heat sink for said magnets;
a sleeve of non-magnetizable material installed over said magnets and the portion of said layer surrounding said magnets.

4,625,136

BRUSH ASSEMBLY FOR ELECTRICAL MACHINE

Winfried Kipke, Belm, Fed. Rep. of Germany, assignor to Max Frost KG Maschinen-und Apparatebau, Bohmte, Fed. Rep. of Germany

Filed Dec. 24, 1984, Ser. No. 685,316
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346595
Int. Cl.[4] H01R *39/38, 39/40*
U.S. Cl. 310—239 **11 Claims**

1. A brush assembly for an electrical machine, the assembly comprising:
a holder having
a pair of generally parallel side walls having confronting inner faces,
a guide wall extending along and between the inner faces and in turn having an inner face defining with the faces

of the side walls a passage extending in a longitudinal direction and having a longitudinally forwardly open front end, and

an angled surface adjacent the front end;

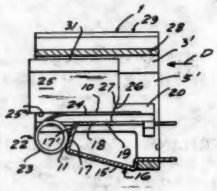
a brush in the passage having

a longitudinal guide face longitudinally slidable on the inner face of the guide wall but out of contact with the side walls,

an opposite longitudinal face turned away from the guide wall, and

axially opposite front and rear ends;

a coil spring having a coiled part engaged between the angled surface and the opposite brush face at the front end



of the brush to transversely urge the brush against the inner face of the guide wall and a free end extending longitudinally back along the opposite face longitudinally past the rear end of the brush; and

a pusher block carried on the free end in the passage longitudinally behind and engaging the rear end of the brush, the rear end of the brush and the pusher block having flatly engaging pusher faces extending obliquely of the direction, forming with the direction a forwardly open obtuse angle, and defining a plane transverse to the direction, whereby as the spring seeks to coil up it pushes the brush longitudinally forward in the passage and transmits transverse force between the pusher block and the brush by means of the oblique pusher faces.

4,625,137

PIEZOELECTRIC ACTUATOR USING BIMORPH ELEMENT

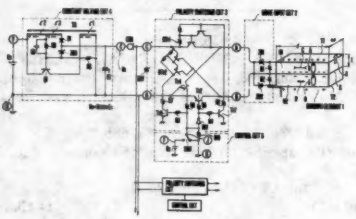
Akira Tomono, Kanagawa, Japan, assignor to Nippon Telegraph & Telephone Public Corp., Japan

Filed Dec. 5, 1984, Ser. No. 678,482

Claims priority, application Japan, Dec. 9, 1983, 58-232442; Mar. 9, 1984, 59-43881; Apr. 14, 1984, 59-75623; Apr. 27, 1984, 59-83700; Jun. 11, 1984, 59-118257; Jul. 23, 1984, 59-152563; Aug. 10, 1984, 59-167328; Dec. 3, 1984, 59-254243

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—317 **21 Claims**



1. A piezoelectric actuator using a bimorph element, comprising:

a bimorph element having at least one pair of piezo elements respectively on two surfaces of a central electrode and an electrode formed on a surface of each piezo element which is opposite to a surface contacting said central electrode, said piezo elements formed on the two surfaces of said central electrode being polarized in the same direction with respect to a direction of thickness of said bimorph element;

a drive input circuit having a first and a second directional voltage limiting circuit, said first directional voltage limiting circuit having a first constant voltage diode, the anode of which is connected to one electrode contacting a positively polarized surface of the piezo element whose negatively polarized surface contacts said central electrode, and said second directional voltage limiting circuit having a second constant voltage diode, the anode of which is connected to the other electrode contacting a negatively polarized surface of the piezo element whose positively polarized surface contacts said central electrode, and wherein the anode of said first constant voltage diode and a cathode of said second constant voltage diode are commonly connected to constitute a first drive input terminal, and that said central electrode serves as a second drive input terminal;

a constant voltage source for applying a constant voltage between said first and said second drive input terminals of said drive input circuit; and

a polarity switching circuit, arranged between said constant voltage source and said drive input circuit for switching a polarity of said constant voltage source with respect to said first and second drive input terminals of said drive input circuit.

4,625,138

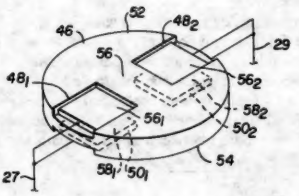
PIEZOELECTRIC MICROWAVE RESONATOR USING LATERAL EXCITATION

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 664,267, Oct. 24, 1984. This application Jan. 30, 1986, Ser. No. 823,975

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—320 **40 Claims**



1. A piezoelectric resonator activated by a lateral excitation, comprising:

a body of piezoelectric material including a pair of opposing major faces; and

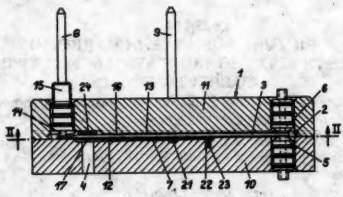
means for providing lateral excitation of said body of piezoelectric material, said means including a pair of spaced recesses on opposite sides of a central open area of said body, a pair of electrodes located in said recesses on said opposite sides, a surface of said area between said electrodes being raised above the uppermost level of said electrodes, and signal generator means connected to said electrodes on said opposite sides to apply said lateral excitation, said central area providing a piezoelectric gap region for energy trapping in said central area of said body.

4,625,139

ELECTRO-PNEUMATIC SIGNAL CONVERTER

Herbert Frisch, Vienna, Austria, assignor to Enfo Grundlagenforschungs AG, Dottingen, Switzerland

Filed Feb. 6, 1986, Ser. No. 826,589
Claims priority, application Austria, Feb. 8, 1985, 371/85
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—330 12 Claims



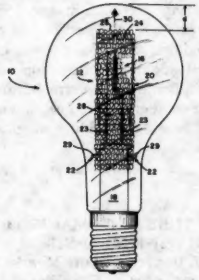
1. An electro-pneumatic signal converter, comprising a piezo-electric bending element disposed in a sealed transmitter casing from which a signal output issues, and which when an electrical voltage is applied bends to thus control a pneumatic signal transmitter including an air inlet seating and an air outlet seating provided opposite each other in the transmitter casing, the piezo-electric bending element being pretensioned against the air inlet seating by a spring, said piezo-electric bending element being disposed in a chamber which closely surrounds it in the transmitter casing, support zones spaced apart in the axial direction of the bending element being provided for this latter, and said piezo-electric bending element being retained and urged against the support zones by a guide spring fixed in the transmitter casing.

4,625,140

TUNGSTEN HALOGEN LAMP WITH LIGHT SOURCE CAPSULE CONTAINMENT DEVICE

Peter R. Gagnon, Georgetown, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 422,311, Sep. 23, 1982, abandoned. This application Jun. 6, 1985, Ser. No. 741,717
Int. Cl.[4] H01K *1/34, 1/50*
U.S. Cl. 313—25 12 Claims



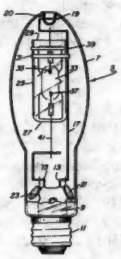
1. A double-enveloped tungsten-halogen lamp comprrising:
(a) an outer envelope;
(b) a light-source capsule;
(c) a stem on which said light-source capsule is mounted within said outer envelope, said stem having a flare which is hermetically sealed to said outer envelope;
(d) a containment mesh substantially surrounding said light-source capule for absorbing burst energy and restricting shards of said light-source capsule from shattering said outer envelope in the event said light-source capsule bursts, said containment mesh having the ability to absorb substantial energy upon deformation thereof by a cansule burst, said containment mesh having a sufficient number of stitches per inch to restrain those shards of said light-source capsule with mass large enough to cause a rupture of said outer envelope from passing through said mesh and impacting said outer envelope, said containment mesh being formed from light-reflecting metal wire and having a minimal effect on the efficacy of said lamp; and
(e) mesh-mounting means for mounting said containment mesh about said light-source capsule and anchoring said mesh on said stem such that the electrical circuit of said lamp is operable.

4,625,141

LOW WATTAGE METAL HALIDE DISCHARGE LAMP ELECTRICALLY BIASED TO REDUCE SODIUM LOSS

William M. Keeffe, Rockport; Zeya K. Krasko, Danvers, both of Mass., and Robert J. Karlotski, Weare, N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 29, 1984, Ser. No. 665,471
Int. Cl.[4] H01J *61/04, 61/18, 61/34*
U.S. Cl. 313—25 13 Claims



1. A metal halide discharge lamp comprising:
an arc tube having a chemical fill including a sodium halide, an electrode at each end thereof and an outer strap member affixed thereto and adjacent at least one of said electrodes;
a heat reducing member surrounding said arc tube and having a metal band surrounding and affixed adjacent one end thereof;
an evacuated outer envelope surrounding said heat reducing member, said evacuated outer envelope having a pair of electrical conductors sealed therein and passing therethrough; and
means for reducing sodium loss from said arc tube that includes positioning said outer strap member of said arc tube adjacent said metal band of said heat reducing member and electrically coupling said strap member, said metal band and said electrode adjacent said outer strap member to one of said pair of electrical conductors and coupling the other one of said electrodes of said arc tube to the other one of said pair of electrical conductors.

4,625,142

METHODS OF MANUFACTURING A DISPENSER CATHODE AND DISPENSER CATHODE MANUFACTURED ACCORDING TO THE METHOD

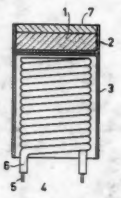
Johannes van Esdonk, and Jacobus Stoffels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,106

Claims priority, application Netherlands, Apr. 1, 1982, 8201371

Int. Cl.[4] H01J 9/04

U.S. Cl. 313—346 DC 9 Claims



1. In a dispenser cathode comprising a body having an emissive surface for emitting electrons from a barium containing emissive material included in the cathode;

the improvement comprising a 20–100 micrometer thick scandium-oxide-containing region of the body disposed immediately beneath said emissive surface.

4. A method of manufacturing a dispenser cathode comprising a body having an emissive surface and including scandium oxide material disposed immediately beneath said emissive surface, said method comprising the steps of:

(a) pressing a metallic powder to form the body;

(b) sintering the body;

(c) adding a layer of scandium oxide powder to the body;

(d) sintering the body; and thereafter

(e) providing the cathode with a barium-containing emissive material.

4,625,143

MULTICOLOR COMPLEX TYPE CATHODE-RAY TUBE FOR USE AS LIGHT SOURCE

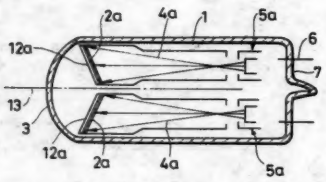
Hiroo Kobayashi, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 652,025

Claims priority, application Japan, Nov. 10, 1983, 58-212682

Int. Cl.[4] H01J 29/50, 29/52, 29/10

U.S. Cl. 313—409 16 Claims



1. A multicolor cathode-ray tube of the complex type for use as a light source, comprising:

a cylindrical envelope having a facing surface at one end thereof and a stem portion at the other end thereof;

a plurality of electron guns, positioned in said stem portion of said cylindrical envelope, for generating respective unfocused electron beams along a longitudinal axis of said tube toward said facing surface of said cylindrical envelope; and

a plurality of fluorescent screens positioned in said cylindrical envelope toward said facing surface to receive electron beams from respective ones of said electron guns, each of said screens being slanted toward a direction of said longitudinal axis of said cylindrical envelope, such that a distance between said screens and said electron guns increases in the direction from a central axis of said envelope to a side wall of said envelope.

4,625,144

COLOR-PICTURE TUBE WITH CORRECTION MAGNETS IN ELECTRON GUN SYSTEM FOR TWIST CORRECTION

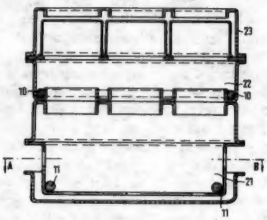
Walter Kornaker, Berkheim, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,068

Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3219954

Int. Cl.[4] H01J 29/51

U.S. Cl. 313—412 24 Claims



1. A color-picture tube comprising:

a faceplate including a phosphor screen and a mask;

a neck portion including therein an electron-gun system having a cathode area for emission of first and second outer electron beams and a center electron beam disposed intermedate said first and second outer electron beams, at least one grid having side walls and at least one color purity and dynamic convergence correction magnet through which said electron beams pass;

a funnel portion in connecting said faceplate and said neck portions; and

at least a first additional correction magnet located at said side walls of said grid and disposed in said electron-gun system between said one correction magnet and said cathode area, said first additional correction magnet being positioned near said first outer electron beam and magnetized to correct for twist errors, said center electron beam not being affected by said first additional correction magnet.

4,625,145

COLOR DISPLAY TUBE WITH MAGNETIC FIELD SHAPING MEANS

Jan Gerritsen; Piet G. J. Barten, and Otto Mensies, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1984, Ser. No. 657,318

Claims priority, application Netherlands, Oct. 6, 1983, 8303423

Int. Cl.[4] H01J 29/56, 29/64

U.S. Cl. 313—413 6 Claims

1. A color display tube comprising:

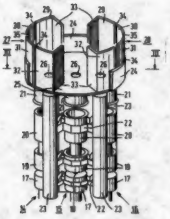
(a) an evacuated envelope having a display window with an inner surface supporting a luminescent display screen;

(b) an electron gun system for producing central and first and second outer electron beams having their axes lying in a longitudinal plane intersecting the display screen, and

for converging the electron beams toward a point of coincidence on said display screen;

(c) first and second deflection means disposed around the electron beam axes for producing first and second deflection fields for deflecting the electron beam in a first direction perpendicular to the longitudinal plane and in a second direction parallel to said plane, respectively; and

(d) field shaping means, arranged at one end of the electron gun system from which the electron beams exit, for locally distorting at least one of the deflection fields to augment convergence of the electron beams such that there is coincidence on the display screen of respective rasters produced by said electron beams;



characterized in that the field shaping means comprises first and second ferromagnetic field shapers defining respective curves and having concave sides facing and symmetrically disposed with respect to the central beam axis, each field shaper comprising at least two spaced-apart plates aligned along the respective curve defined thereby and symmetrically disposed on opposite sides of said plane, at least the ends of each field shaper which are most remote from said plane including substantially flat plates extending toward the central beam axis;

said field shapers locally distorting the first deflection field to a pin-cushion shape without significantly distorting or attenuating the second deflection field, and effecting coincidence of said rasters without substantially defocusing the electron beams.

4,625,146

CATHODE RAY TUBE

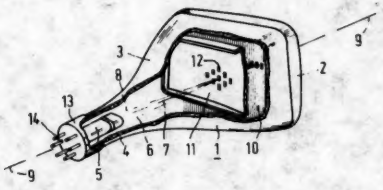
Aart A. Van Gorkum, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 14, 1984, Ser. No. 609,620

Claims priority, application Netherlands, Mar. 16, 1984, 8400841

Int. Cl.[4] H01J *29/50*

U.S. Cl. 313—414 **8 Claims**



1. In a cathode ray tube comprising an evacuated envelope containing a target and an electron gun system including at least one electron gun for producing a respective electron beam directed along a longitudinal axis of the gun and for focussing said electron beam onto said target, said electron gun including, in the direction of propagation of the electron beam, first and second electrodes having facing end portions with respective first and second openings disposed coaxially around said axis, said end portions being separated by a predetermined gap and, when predetermined voltages are applied to said electrodes, effecting production of an accelerating electron lens;

the improvement comprising means for effecting a predefined correction of spherical aberration of the lens, said means comprising a substantially flat, conductive, electron-penetrable member electrically connected to the second electrode and extending across the second opening, said member being located at a distance l from the closest end of the gap, said distance falling within the range $0.25<l/R<2.0$, where R is the radius of the second opening.

4,625,147

INDEX TYPE COLOR PICTURE TUBE

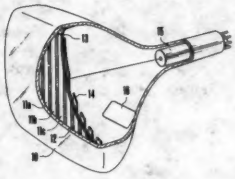
Naomitsu Watanabe; Yoshifumi Tomita, both of Mobara; Atsushi Suzuki, and Hajime Yamamoto, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,760

Claims priority, application Japan, Jul. 8, 1983, 58-123207

Int. Cl.[4] H01J *29/20;* **C09K** *11/08*

U.S. Cl. 313—468 **2 Claims**



1. In an index type color picture tube including a stripe type fluorescent screen having stripe-shaped phosphor layers for green blue and red color and a stripe-shaped phosphor layer for index detection, the improvement wherein the phosphor for said red color phosphor layer comprises a Y_2O_2S:Eu phosphor containing 0.01 to 3 ppm of either one or both of Tb and Pr.

4,625,148

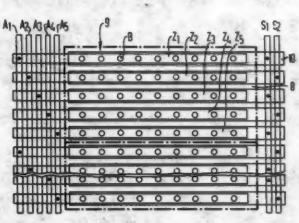
GAS DISCHARGE DISPLAY DEVICE WITH AN AUXILIARY ANODE CONTROL PLATE

Walter Geffcken, Munich, Fed. Rep. of Germany, assignor to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 479,206, Mar. 28, 1983, abandoned. This application Dec. 4, 1985, Ser. No. 804,820

Int. Cl.[4] H01J *17/49;* **H05B** *41/14*

U.S. Cl. 313—485 **8 Claims**



1. A gas discharge display device having a gas-filled space defined on one side by a front plate and on a side opposite thereto by a back plate and subdivided by a control plate into a gas discharge space and a post-acceleration space, the control plate carrying electrode runs including column conductors and anode row conductors forming a matrix having crosspoints

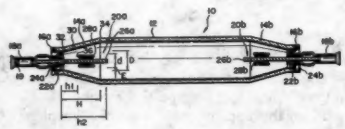
defining image points, a fluorescent screen disposed on the side of the front plate facing the control plate and defining the post-acceleration space, the fluorescent screen having an anode layer thereon, and at least one insulated cathode on the side of the back plate facing the control plate and defining the gas discharge space, and an auxiliary control plate having anode conductor strips on at least one side thereof that are parallel with the anode row conductors, the device comprising groupings of anode row conductors, each group thereof having M sequentially numbered conductors; groupings of anode conductor strips, each group thereof having N sequentially numbered conductors, each of said anode row conductors being aligned with a corresponding one of said anode conductor strips forming an aligned conductor pair; conductor pair selecting means for selecting each aligned conductor pair which includes simultaneously applying a respective selection potential to each conductor of an aligned conductor pair.

4,625,149

METAL VAPOR DISCHARGE LAMP INCLUDING AN INNER BURNER HAVING TAPERED ENDS

Yuji Danno, and Kouzou Kawashima, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 9, 1984, Ser. No. 639,219
Claims priority, application Japan, Aug. 10, 1983, 58-144993
Int. Cl.[4] H01J *61/33*
U.S. Cl. 313—623 **5 Claims**



1. A metal vapor discharge lamp comprising:

a light emitting tube of translucent ceramics having a straight tube section having a diameter of greater than 9 mm and a pair of tube end sections formed integrally with said tube, one at each end of said straight tube section thereby defining a first end and a second end such that each said tube end section has its diameter gradually decreased from a boundary with said straight tube section;

a pair of sealing members made of ceramics which hermetically seal said ends of said decreased-diameter portions of said tube end sections;

a pair of discharge electrodes each having an electrode rod and a radiator section formed on and around the electrode rod, said discharge electrodes formed one at each end of the light emitting tube such that each said discharge electrode is supported by the corresponding sealing member;

at least one light emitting metal added within said light emitting tube; and

a rare gas within the light emitting tube for starting the tube;

wherein:

said light emitting tube being formed such that a height H from the sealing member on said first end to the boundary of the straight tube section and the tube end section on said first end is greater than a height h_1 from the first end sealing member to a closest end of said radiator section of the discharge electrode on said first end, or $H > h_1$, and

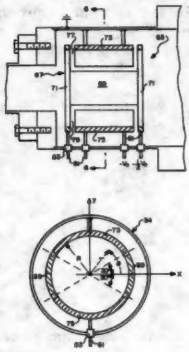
that a minimum radius D/2 of the tube end section of the light emitting tube is greater than an outer radius d/2 of said radiator section of said discharge electrode with the difference E between these radii being 1.5 mm or less, or $E = D/2 - d/2 \leqq 1.5$ mm.

4,625,150

ELECTRON BEAM CONTROL ASSEMBLY FOR A SCANNING ELECTRON BEAM COMPUTED TOMOGRAPHY SCANNER

Roy E. Rand, Palo Alto, Calif., assignor to Imatron, Inc., San Francisco, Calif.

Filed Apr. 16, 1984, Ser. No. 600,464
Int. Cl.[4] H01J *29/84*
U.S. Cl. 315—111.31 **19 Claims**



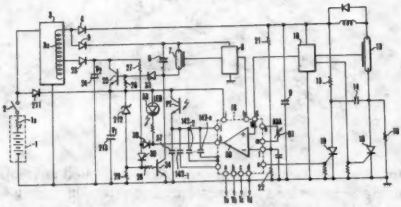
1. An electrode for removing ions from an electron beam having a beam envelope, and propagating along an axis, the electrode being of substantially cylindrical configuration and extending substantially co-axially with the electron beam and comprising: a pair of end rings and four lengthwise-extending cylinder sections each spanning predetermined arcs of the cylinder periphery; oppositely positioned first and second such cylinder sections being electrically isolated from one another and from the end rings and the third and fourth such sections; the end rings being electrically connected in common with the third and fourth cylinder sections; and the resulting electrically separate entities being connected to voltages of predetermined values to provide removal of positive ions from the electron beam and at the same time provide a uniform electric field across the cross-section of the beam envelope.

4,625,151

FLASH DEVICE WITH BACK-UP CAPACITOR VOLTAGE SUPPLY

Hiroyuki Kataoka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,746
Claims priority, application Japan, Oct. 28, 1982, 57-190594
Int. Cl.[4] H05B *41/32*
U.S. Cl. 315—241 P **8 Claims**



1. A flash device comprising:

(a) a power supply circuit;

(b) a booster circuit for boosting the voltage of said power supply circuit;

(c) a flash energy storing capacitor arranged to be charged with the output of said booster circuit;

(d) flash tube means for emitting a flash of light by discharging the charge stored at said flash energy storing capacitor;

(e) an integrated circuit arranged to be rendered operative by power from said power supply circuit;

(f) a back-up capacitor arranged to store an electric charge to be used for a back-up purpose; and

(g) switching means between said back-up capacitor and said integrated circuit for transmitting the electric charge of said back-up capacitor to said integrated circuit when a charging action of said flash energy storing capacitor or a light emitting action by said flash means is being performed.

4,625,152

TRICOLOR FLUORESCENT LAMP

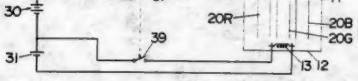
Katsumasa Nakai, Amagasaki, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 9, 1984, Ser. No. 628,738

Claims priority, application Japan, Jul. 18, 1983, 58-131593

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—317 **4 Claims**



1. A tricolor fluorescent lamp operating on a DC power source through at least a ballast resistor which comprises:

an outer envelop having a closed top and an open bottom;

a stem hermetically sealed to the bottom of the outer envelop for defining within the outer envelop a sealed space;

an ionizable medium including an inert gas and mercury vapor filled within said sealed space at low pressure;

three bent tubular envelops of a generally inverted U-shaped configuration disposed within said sealed space with one end of each tubular envelop being hermetically sealed to the stem and with the other end of each tubular envelop being open to define thereby three separate discharge paths within said sealed space, the substantially entire inner surfaces of the tubular envelops being coated with fluorescent substances emitting different colors;

a common cathode disposed on the stem at the position adjacent to the open ends of the tubular envelops;

three anodes disposed on the stem within the confines of the sealed ends of the respective tubular envelops for being sequentially energized such that the colors emitted from the three tubular envelops can be additively mixed in various proportions to produce a desired color; and

said tricolor tubular fluorescent lamp is further characterized in that said outer envelop is the form of an equilateral triangle prism with a closed top and an open bottom sealed by the stem of the correspondingly shaped equilateral triangle, said stem being provided at its apexes of the triangle with the respective anodes and provided at its center thereof with said common cathode so that the open ends of said tubular envelops are directed to the center of the stem with the axes of the tubular envelop being in parallel relationship with each other.

4,625,153

SENSOR SYSTEM FOR TELEVISION PICTURE TUBES

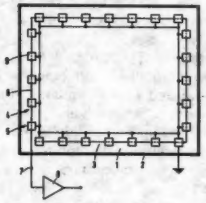
Ljubomir Micic, Freiburg; Rolf D. Burth, Emmendingen; Thomas Fischer, Umkirch, and Rainer Schweer, Mengen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 3, 1984, Ser. No. 637,509

Claims priority, application European Pat. Off., Aug. 5, 1983, 83710052.8

Int. Cl.⁴ H01J *29/56*; H04N *17/02*

U.S. Cl. 315—370 **3 Claims**



1. A sensor system for automatically aligning the deflection system of a television picture tube to achieve horizontal and vertical pincushion correction, comprising:

a rectangular frame disposed at the edge of the tube screen in the sweep range of the electron beam, said frame being a stripelike, regular arrangement of alternately transparent and opaque segments, said transparent and opaque segments disposed within the television picture tube;

said opaque segments being metal areas; and

said sensor system including a conductive path having an external terminal for connection to an amplifier having a high input impedance said conductive path running along the edge of said screen, and said conductive path being shielded from the cathode of said television picture tube at regular intervals by said metal areas, said metal areas being electrically interconnected, and said metal areas being grounded during an aligning operation.

4,625,154

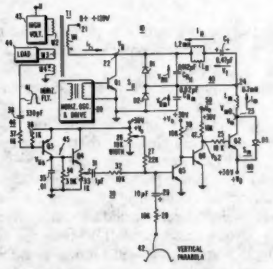
DEFLECTION CIRCUIT WITH A SWITCHED MODE MODULATOR CIRCUIT

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 30, 1985, Ser. No. 760,546

Int. Cl.⁴ H01J *29/56*

U.S. Cl. 315—371 **20 Claims**



1. A deflection circuit with a switched mode modulator circuit, comprising:

a line deflection winding;

a trace capacitance for developing a line trace voltage;

a trace switch coupled to said line deflection winding and said trace capacitance and operated at a line rate for applying said trace voltage to said line deflection winding during a line trace interval to generate a line scanning current in said line deflection winding;

a deflection retrace capacitance coupled to said line deflection winding for forming a deflection retrace resonant circuit during a line retrace interval to generate a deflection retrace pulse voltage;

a modulator inductance coupled to said trace switch and to said line deflection winding;

a modulator retrace capacitance coupled to said modulator inductance for forming a modulator retrace resonant circuit to generate a modulator retrace current in said modulator inductance during said line retrace interval;

a source of supply voltage; and

a modulator switch coupled to said trace switch, to said source and to said modulator inductance and responsive to a line rate signal and to a modulator control signal for switching between conductive and nonconductive states at a controllable instant within said line trace interval that varies in accordance with said modulation control signal to generate a switched mode modulation voltage that is directly applied to said modulator inductance for modulating said line scanning current in accordance with said modulator control signal,

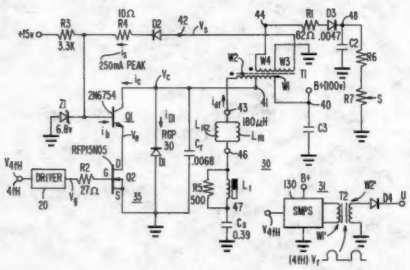
wherein said modulator switch is conductive during said line retrace interval to provide therethrough a current path for said modulator retrace current.

4,625,155

RESONANT SWITCHING APPARATUS USING A CASCODE ARRANGEMENT

Wolfgang F. W. Dietz, New Hope, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 3, 1984, Ser. No. 677,522
Int. Cl.[4] H01J *29/76*
U.S. Cl. 315—408 **19 Claims**



1. An apparatus for generating a periodic resonant pulse voltage across an inductance, comprising:

an inductance;

a resonating capacitance coupled to said inductance;

a source of first voltage;

a controllable switching arrangement including first and second switching means coupled together in a series cascode arrangement, said cascode arrangement applying said first voltage to said inductance for storing energy therein;

a source of a periodic switching signal coupled to said second switching means, each cycle of said switching signal including a turn-on portion and a turn-off portion, the initiation of said turn-off portion making said second switching means nonconductive to enable said inductance and resonating capacitance to form a resonant circuit that generates a resonant pulse voltage at a terminal of said resonant circuit during a first interval of the alternating voltage being developed at said terminal, said controllable switching arrangement providing a damper action that terminates the generation of said resonant pulse voltage at the end of said first interval, prior to the initiation of the turn-on portion of said switching signal; and

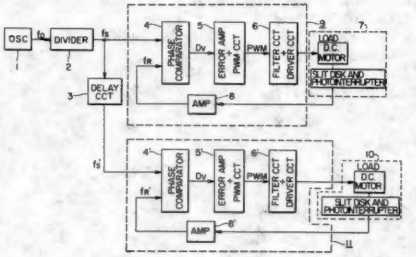
means responsive to the voltage at said resonant circuit terminal for supplying a control current to a control electrode of said first switching means during the occurrence of said damper action to enable said first switching means to conduct current from said inductance during conduction of said second switching means.

4,625,156

CONTROL DEVICE

Yutaka Komiya, Tokyo; Masahiro Tomosada, Kawasaki; Shinichi Nakamura, Tokyo; Masanori Miyata, Yokohama; Hideki Adachi, Kawasaki, and Masayuki Hirose, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,619
Claims priority, application Japan, Nov. 2, 1982, 57-191789
Int. Cl.[4] H02P *5/52*
U.S. Cl. 318—85 **7 Claims**



1. A control device comprising:

first and second driving means for driving operable means;

first and second detecting means for generating first and second detection signals respectively indicating the drive states of said first and second driving means;

reference signal generating means for generating first and second reference signals of different phases; and

control means for controlling said first and second driving means; said control means including first and second comprison means for separately comparing said first and second detection signals to said first and second reference signals, respectively and means for generating first and second control signals for driving said first and second driving means in response to output signals from said first and second comparison means, respectively;

said control means being adapted to generate said first and second control signals in response to the phase difference between said first and said second detection signals and said first and second reference signals, respectively.

4,625,157

WINDSHIELD WIPER CONTROL

Horace R. Phillimore, 20 Washington Ave., Plainfield, N.J. 07060

Continuation of Ser. No. 277,273, Jun. 25, 1981, abandoned. This application Dec. 28, 1984, Ser. No. 687,466
Int. Cl.[4] G02P *1/04*
U.S. Cl. 318—443 **12 Claims**

1. Apparatus for controlling the speed of a windshield wiper, which comprises

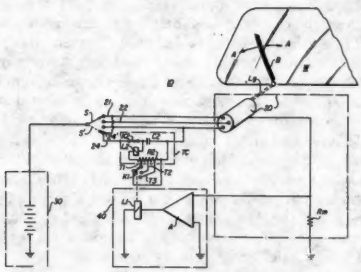
a motor for operating the wiper,

means for operating said motor intermittently,

means for producing an electrical signal having a value in accordance with the speed of said motor, and

means connected to the operating means and responsive

solely to said electrical signal for automatically changing the rate of intermittent operation of said motor when it undergoes a change in speed,



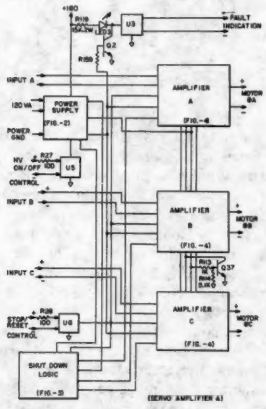
wherein the changing means is actuated independently of the position of said windshield wiper.

4,625,158

MOTOR CONTROL CIRCUIT FOR VARIABLE RELUCTANCE MOTOR

Jon C. Taenzer, Palo Alto, Calif., assignor to Adept Technology, Inc., Sunnyvale, Calif.

Filed Jan. 25, 1985, Ser. No. 695,170
Int. Cl.[4] H02P 5/40
U.S. Cl. 318—701 **23 Claims**



1. A control system for driving three electrically isolated coils of a high current, three-phase, variable reluctance motor comprising a source of high voltage for driving said coils, separate amplifier means connected to each of said electrically isolated coils for providing a pulse width modulated signal to switch said high voltage source applied to each said coil of said three-phase motor in response to a microprocessor supplied digital input command signal, each of said separate amplifier means including:

a constant voltage level reference source for gain circuitry in said amplifier,

input means for converting a digital input command to a pulse width modulated input control signal,

means for converting said pulse width modulated input signal to a steady state command voltage signal to represent the desired motor torque and coil current for said connected coil,

feedback means coupled to one of said coils for developing a feedback signal representing current in said coil,

means coupled to said converting means and said feedback means for comparing the desired current level in the coils with the actual current in the coils,

means responsive to said comparison for defining an error signal to each coil to equalize said command signal and said feedback signal, and

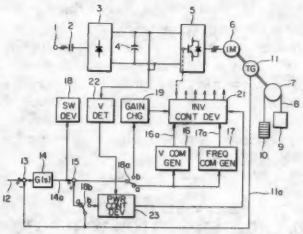
means for monitoring negative operating conditions in said amplifier and cutting off said high voltage in response to detection of negative operating conditions in said amplifier or said motor coil.

4,625,159

CONTROL APPARATUS FOR ELEVATOR

Hiroyuki Ikejima, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,712
Claims priority, application Japan, Dec. 27, 1984, 59-276449
Int. Cl.[4] H02P 5/34
U.S. Cl. 318—811 **5 Claims**



1. In a control apparatus for an elevator wherein an inverter is connected to a D.C. power source to change D.C. power into A.C. power, and an induction power is driven by the A.C. power so as to operate a cage; a control apparatus for an elevator comprising a first inverter control command generation portion which controls a torque of said induction motor with a slip frequency command signal that corresponds to a deviation between a speed command signal and a speed signal of said induction motor, regenerative power detection means to detect whether or not electric power which is regenerated from said induction motor to the D.C. power source side is null, a second inverter control command generation portion which delivers a slip frequency command of making null the electric power that is regenerated to said D.C. power source side, on the basis of an output signal of said regenerative power detection means and the speed signal, and a switching device which operates said first inverter control command generation portion when the slip frequency command signals is plus and which switches the operation to said second inverter control command generation portion when the slip frequency command signal is minus.

4,625,160

VARIABLE SPEED CONSTANT FREQUENCY GENERATING SYSTEM

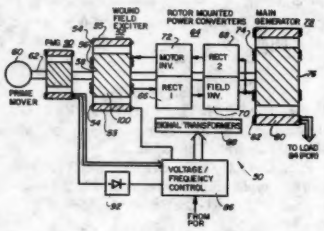
David J. Hucker, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 17, 1984, Ser. No. 682,250
Int. Cl.[4] H02P 9/30; H02K 7/10, 23/60, 19/10
U.S. Cl. 322—32 **19 Claims**

1. In a generating system for generating output power at a desired frequency, the system having an exciter and a main generator both with rotors connected by a shaft which is driven by a variable-speed source of motive power, the exciter rotor having an armature winding which develops alternating current power at a frequency dependent upon the speed of the shaft, the main generator rotor having a field winding which

develops a magnetic field in space occupied by a main generator armature winding which develops the output power in response to current through the field winding, a circuit connecting the exciter armature and main generator field windings, comprising:

a rectifier connected to the exciter armature winding for rectifying the power developed thereby to derive DC power;



an inverter connecter between the rectifier and the main generator field winding; and

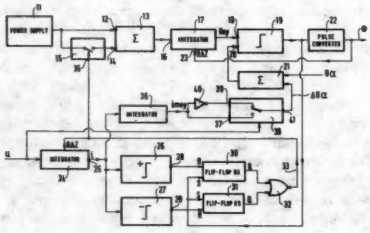
means coupled to the inverter and responsive to the frequency of the exciter alternative current power for controlling the inverter to convert the DC power into current for the main generator field winding to establish a magnetic field which rotates relative to the main generator armature windings at a rate which maintains the output power at the desired frequency.

4,625,161

CONTROL PULSE GENERATOR FOR THYRISTORS SUPPLYING A REACTIVE POWER REGULATING INDUCTOR IN AN ELECTRICAL POWER NETWORK

Patrick Charles, Mareil sur Mauldre, France, assignor to Cgee Alsthom, France

Filed Jan. 16, 1985, Ser. No. 691,810
Claims priority, application France, Mar. 13, 1984, 84 03837
Int. Cl.[4] G05F *1/70*
U.S. Cl. 323—210 **3 Claims**



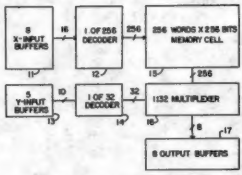
1. Control pulse generator for thyristors supplying a reactive power regulating inductor in an electrical power network, said inductor being connected to the network via a thyristor-controlled two-way static switch, said pulse generator comprising a sawtooth signal generator having an output connected to one input of a comparator, said comparator having another input which receives a control signal for varying the firing angle of the thyristors, the output of said comparator being connected to a circuit for generating said thyristor control pulses, the output of said circuit being connected both to the thyristors' gates and to a sawtooth signal generator zero reset input, said sawtooth signal generator including means for generating a signal of slope a or 2a, switching between a 2a-sloped signals being controlled by the disappearance of current from said inductor, said thyristor control pulse generator circuit developing an image of the current in said inductor, said image being based upon a voltage U being itself an image of the voltage across the terminals of the inductor which is fed to an integrator having an output connected to an integrator reset signal generator, driven by the output signal from said comparator, and wherein the output of said integrator is also connected to a circuit estatlishing the mean value of said current, the output of said latter circuit being connected directly to one of the inputs of a two-input switch with a single, common output and to the other input of the same switch via an invertor defining an inversion control for said switch and being connected to the input of a voltage U integrator, the sign change of voltage U alternately causing switching to one, then the other of the two inputs to said switch whose output drives one of the two inputs of a summing circuit, the other input of said summing circuit receiving a firing angle α control voltage $U\alpha$ and the output of said summing circuit constituting said control signal for varying said firing angle, going to said comparator.

4,625,162

FUSIBLE LINK SHORT DETECTOR WITH ARRAY OF REFERENCE FUSES

Robert J. Bosnyak, Mountain View, Calif., assignor to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Oct. 22, 1984, Ser. No. 663,806
Int. Cl.[4] G01R *31/02*; G11C *29/00*; G06F *11/00*
U.S. Cl. 324—51 **4 Claims**



1. Circuitry for testing for short circuits in a fusible link array, said array having a plurality of quadrants of discrete fusible links each having a nominal resistance RF, any short circuit in one of said fusible links presenting a resistance which is substantially lower than RF, said circuitry comprising:

means for electrically isolating one of said fusible links in each of said quadrants from the other of said links;

an array comprising more than two reference fusible links, the total resistance of each reference fusible link array being approximately $\frac{1}{4}$ RF;

means for simultaneously applying a voltage across one of said fusible links under test in each of said quadrants and across said array of reference fusible links; and

means for comparing the voltage across each of said fusible links under test with the voltage across said array of reference fusible links to provide an indication of the presence or absence of a short circuit across one or more of said fusible links under test.

4,625,163

DISPLAY TEMPERATURE COMPENSATOR FOR ELECTRIC METER

Warren R. Germer, Dover, N.H., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1984, Ser. No. 599,744
Int. Cl.[4] G01R *11/64*; H03H *3/04*; G02F *1/13*
U.S. Cl. 324—103 R **3 Claims**

1. A temperature compensator for a liquid crystal display, wherein said liquid crystal display employs combinations of at least three voltages switched thereto in a cyclic pattern for selectively energizing and deenergizing a plurality of display segments, said liquid crystal display having a threshold for

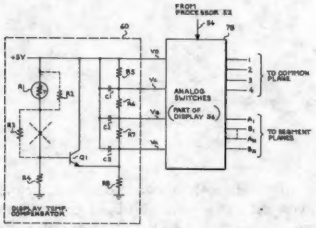
energizing and deenergizing said display segments, said threshold being non linearly variable with temperature, comprising:

a first voltage divider between a substantially constant supply voltage and a reference voltage;

said first voltage divider including a first resistor having a first terminal connected at a first junction to said supply voltage and a second terminal, a second resistor having a third terminal connected at a second junction to said second terminal and a fourth terminal, terminal, and at least a third resistor having a fifth terminal connected at a third junction to said fourth terminal and a sixth terminal connected to said reference voltage;

a linear amplifying device connected between said third junction and said substantially constant supply voltage, said linear amplifying device being responsive to a control signal for controlling an amount of current through said third resistor and thus for controlling a voltage appearing at said third junction;

a thermistor connected between said substantially constant supply voltage and a control element of said linear amplifying device;



a fourth resistor connected between said control element and said reference voltage, a second voltage divider formed by said thermistor and said fourth resistor being effective for producing said control signal;

said thermistor having a non linear temperature coefficient of resistance;

said non linear temperature coefficient of resistance and and at least a resistance of said third and fourth resistors having a relationship which controls a voltage at said third junction to a value which varies non linearly with temperature in a substantially constant relationship to said threshold over a substantial temperature range;

said substantially constant supply voltage being said first voltage;

a voltage at said second junction being said second voltage;

a voltage at said third junction being said third voltage;

a voltage difference between said substantially constant supply voltage and said third voltage being established by a current in said third resistor; and

a ratio between said first, second and third voltages being scaled by resistances of said first and second resistors.

4,625,164

VACUUM ACTUATED BI-LEVEL TEST FIXTURE

Willis E. Golder, Holliston; Joseph A. Ierardi, Norwood; Robert E. Staples, Lakeville, and Michael C. Boyle, Norton, all of Mass., assignors to Pylon Company, North Attleboro, Mass.

Filed Mar. 5, 1984, Ser. No. 586,010
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—158 F **9 Claims**

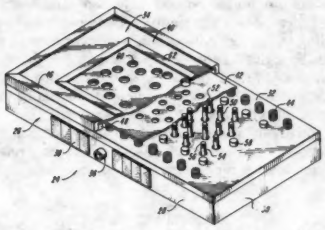
1. A bi-level test fixture connectable to automatic testing equipment for providing in-circuit and functional testing of an electronic circuit device, comprising:

a first plurality of spring-loaded probes having ends fastened to the test fixture for providing a first plurality of stationary signal contacts on a first level defining an in-circuit testing array;

a second plurality of spring-loaded probes having ends fastened to the test fixture for providing a second plurality of stationary signal contacts the ends of which terminate on a second level different from the first level defining a functional testing array;

an electronic circuit device receiving face; and

means for mounting the electronic circuit device receiving face to the test fixture for movement both to the first level



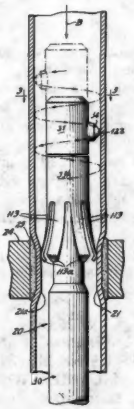
for electrically connecting the electronic circuit device received on the electronic circuit device receiving face to the in-circuit testing array for in-circuit testing by the automatic testing equipment, and for movement to the second level for electrically connecting the electronic circuit device received on the electronic circuit device receiving face to the functional testing array for functional testing by the automatic testing equipment.

4,625,165

TUBE INSPECTION PROBE WITH ROTATING EDDY CURRENT COIL

Samuel Rothstein, 79-19 269th St., New Hyde Park, N.Y. 11040

Continuation-in-part of Ser. No. 306,175, Sep. 28, 1981, abandoned. This application Dec. 7, 1983, Ser. No. 558,955
Int. Cl.[4] G01N *27/90*; G01R *33/12*
U.S. Cl. 324—220 **10 Claims**



7. Tube inspection apparatus comprising a probe adapted for insertion into a tube or the like to sense local defects in the wall of the tube, said tube being mounted in a plurality of supports spaced from each other longitudinally of the tube, said probe comprising a main body havng a longitudinal axis, a rotatable head mounted on said main body for rotation about its said longitudinal axis, drive means on said probe and connected to said rotatable head for rotating its said rotatable head, an out-

wardly projecting sensing member mounted for radial inward and outward movement on said rotating head and having an outer end for contacting said tube interior wall surface during rotation of said rotatable head, means biasing said sensing member in the outward direction of said probe, means connected to said sensing member and responsive to movement of said sensing member for generating first electrical signals dependent upon a physical characteristic of the portion of said tube wall surface engaged by the sensing member, and eddy current coil mounted on said main body and spaced from said sensing member for generating second electrical signals corresponding to the locations of said support probe as said probe is pulled through said tube and variable speed drive means connected to said probe for pulling said probe through said tube at two different rates dependent upon the location of said eddy current coil with respect to said supports, one of said rates being relatively fast with said sensing member intermediate said supports and the other of said rates being relatively slow with said sensing member adjacent a support.

4,625,166

METHOD FOR MEASURING MAGNETIC POTENTIALS USING HALL PROBES

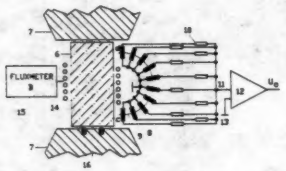
Dietrich Steingroever, 5060 Berg.-Gladbach 1, and Erich Steingroever, Flensburger Str. 33, 5300 Bonn 1, both of Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,079

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305888

Int. Cl.[4] G01R *33/14, 33/06, 19/08*

U.S. Cl. 324—223 **5 Claims**



1. Method of measuring the hysteresis curve of a magnetic material, including the steps of:

subjecting the material to a magnetic field;

obtaining the summation voltage of a plurality of Hall probes spaced from each other in an exclusively non-magnetic arcuate path with the respective endmost probes located adjacent two spaced points on said material to provide a value that is proportional to the magnetic field intensity within said material;

obtaining the value of the magnetic flux density in the material; and

deriving a hysteresis curve of said material from obtained magnetic flux density and magnetic field intensity values.

4,625,167

FLAW IMAGING IN FERROUS AND NONFERROUS MATERIALS USING MAGNETO-OPTIC VISUALIZATION

Gerald L. Fitzpatrick, Issaquah, Wash., assignor to Sigma Research, Inc., Richland, Wash.

Filed Jul. 5, 1983, Ser. No. 510,662

Int. Cl.[4] G01N *27/82, 21/21;* **G02F** *1/09*

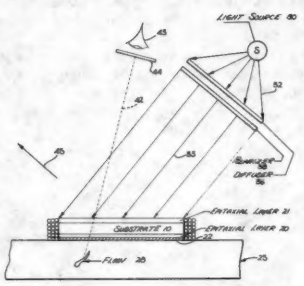
U.S. Cl. 324—235 **17 Claims**

1. An apparatus for detecting and providing images of flaws, voids, discontinuities, or the like in a target material, comprising:

a magnetic material having a plurality of magnetic domains, said magnetic material comprising a first magnetic epitaxial layer disposed on a first surface of a non-magnetic substrate and a second magnetic epitaxial layer disposed on a second surface of said non-magnetic substrate, said first magnetic epitaxial layer being placed in proximity to said target material;

magnetic field generation means disposed about said magnetic material for generating and applying a variable magnetic field to said target material and to said magnetic material;

light gneration means disposed above said second magnetic epitaxial layer for generating polarized light and projecting said polarized light through said magnetic material and onto said target material, said projected light reflecting from said target material and through said magnetic material;



analyzer means disposed above said second magnetic epitaxial layer and away from said light generation means for observing the rotation of the plane of polarization of said reflected light;

said polarization plane being rotated as a result of the realignment of said magnetic domains caused by magnetic field perturbations in areas of said magnetic material in proximity to a flaw, void, discontinuity or the like, in said target material;

whereby an image of said flaw, void, discontinuity or the like is detected by observing magnetic field perturbations in said magnetic material.

4,625,168

PHANTOM FOR NMR APPARATUS

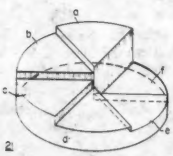
Albertus C. Meyer; Hans H. Tuithof, and Jacobus Mulder, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,672

Claims priority, application Netherlands, Aug. 1, 1983, 8302721

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—300 **12 Claims**



1. A phantom for NMR imaging apparatus comprising a cylindrical, plastic block having a circular cross section divided into a plurality of sectors, each sector having a pattern comprised of a plurality of axially extending cavities adapted to be filled with a contrast medium for NMR measurements, the cavities in each sector having cross section dimensions and

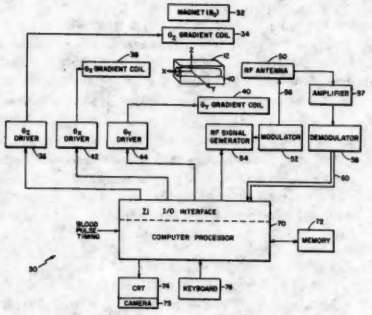
spacing which are different from the cross section dimensions and spacing of the cavities in the other sectors.

4,625,169

FLOW IMAGING BY MEANS OF NUCLEAR MAGNETIC RESONANCE

Van J. Wedeen, and Bruce R. Rosen, both of Cambridge, Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Aug. 10, 1984, Ser. No. 640,040
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **32 Claims**



1. Nuclear magnetic resonance apparatus for forming an image representative of a velocity profile of a fluid flowing in a vessel comprising

means for stimulating the fluid to produce a time-dependent magnetic resonance signal,

means for producing Fourier-transformed data from said time-dependent magnetic resonance signal,

said means for stimulating including means for introducing into a predetermined component of said Fourier-transformed data, spatially dependent phase information indicative of said velocity profile of said fluid, and

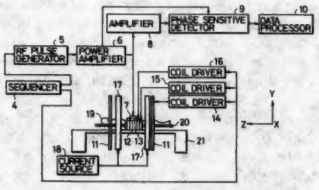
means for extracting said predetermined component of said Fourier-transformed data for display as said image representative of said velocity profile.

4,625,170

NMR IMAGING METHOD AND APPARATUS

Etsuji Yamamoto, Hachioji; Shigeru Matsui, Koganei; Masuo Kuroda, Nakano, and Hideki Kohno, Suginami, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,154
Claims priority, application Japan, Aug. 1, 1983, 58-139423
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **5 Claims**



1. An NMR imaging method comprising:

the step of applying a first RF field pulse for exciting the magnetization of an object to be imaged, which is placed in a predetermined magnetic field;

the step of applying a second RF field pulse for generating a spin echo;

the step of applying a first gradient field pulse having an integrated value effectively proportional to the amount of phase encoding of a signal detected including dividing said first gradient field pulse into a first portion to be applied before said second RF field pulse and a second portion to be applied after said second RF field pulse, said first and second portions having an equal amplitude, and controlling the amount of phase encoding by changing the amplitude of said first gradient field pulse; and

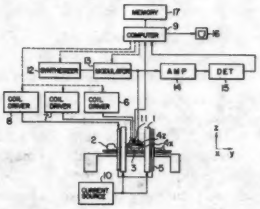
the step of applying a second gradient field pulse having a gradient in a direction from that of said first gradient field pulse together with the spin echo which is generated by the application of said second RF field pulse.

4,625,171

IMAGING APPARATUS USING NUCLEAR MAGNETIC RESONANCE

Kensuke Sekihara, Hachioji; Masao Kuroda, and Hideki Kohno, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 579,967
Claims priority, application Japan, Feb. 14, 1983, 58-23547
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—312 **7 Claims**



1. An imaging apparatus for obtaining a nuclear spin distribution image of an object along a two-dimensional section, comprising:

means for generating a static magnetic field which has an intensity error distribution along said two-dimensional section;

exciting means for repeatedly exciting nuclear spins in said object by repeatedly applying a pulsive high frequency magnetic field;

means for generating a gradient magnetic field successively along each of a plurality of different directions across said two-dimensional section to produce frequency dispersion of nuclear spins along each of the directions;

signal detecting means for detecting nuclear magnetic resonance signals induced during generation of said gradient magnetic field for a plurality of different directions thereof;

memory means for storing data of said intensity error distribution of said static magnetic field;

computer means for performing operations for each of said nuclear magnetic resonance signals detected by said signal detecting means to reconstruct an image in accordance with at least data read out from said memory means, said computer means performing the operations of analyzing a frequency spectrum of each of said nuclear magnetic resonance signals to obtain a projection along a frequency axis, and projecting back a value of said projection at each frequency to each picture point of said image to be reconstructed, said frequency being a resonance signal at said image point, said computer means correcting a frequency error of said frequency caused by said intensity error distribution of said static magnetic field in accordance with data read out from said memory means; and

display means responsive to said computer means for displaying the reconstructed image.

4,625,172
APPARATUS FOR SUPPLYING AC CURRENT TO AN UNDERWATER CABLE

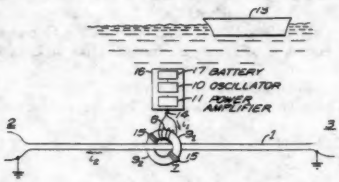
Kazuomi Yamamura, Yokohama; Hideo Ishihara, Kamakura; Yoshinao Iwamoto, Fujimi; Shizuo Suzuki, Yokohama; Yuichi Sirasaki, Tokyo, and Kenichi Asakawa, Hachiohji, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Division of Ser. No. 282,876, Jul. 13, 1981, Pat. No. 4,540,942. This application Jun. 19, 1985, Ser. No. 746,346

Claims priority, application Japan, Jul. 16, 1980, 55-96253; Jul. 16, 1980, 55-96252

Int. Cl.[4] G01V *3/11;* **H02G** *1/10;* **G05D** *1/03*

U.S. Cl. 324—326 **1 Claim**



1. An apparatus for supplying an AC current signal to a cable under water, comprising: a buoyant water-tight non-metallic container; a battery, an oscillator, and a power amplifier arranged in said container; said battery being electrically connected to said oscillator to supply DC power thereto, said oscillator being electrically connected to said amplifier for supplying AC current thereto; an annulus of magnetic material placed around said cable so as to leave an annular space therebetween; an exciting winding placed around said annulus and electrically connected to said power amplifier for supplying said winding with an AC current and thereby induce an AC signal in the cable by electro-magnetic induction, and an electrically non-conducting annular diaphragm wall closing said annular space to prevent power loss by flow of water through said space.

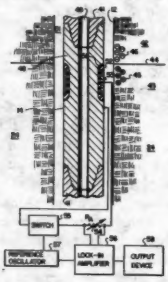
4,625,173
SYSTEM FOR MONITORING FORMATION SPONTANEOUS POTENTIAL AND POLARIZATION CONSTANT WHILE DRILLING

MacMillan M. Wisler, Lafayette, La.; James R. Birchak, and Richard A. Meador, both of Spring, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,251

Int. Cl.[4] G01V *3/00, 3/08/3/18*

U.S. Cl. 324—351 **8 Claims**



1. A system for measuring the spontaneous potential of earth formations which are at a certain electrical potential due to the concentration of ions within the formation, comprising:

a conductive cylindrical section of drill string;

a conductive electrode positioned adjacent, but insulated from, said conductive section of drill string, said electrode being in electrically conductive communication with conductive drilling fluids between the drill string and the earth formations forming the borehole walls;

means for electrically connecting said conductive drill string and said electrode through an electrically conductive path therebetween, including switching means and a resistor connected in series therewith for selectively interrupting said conductive path; and

means for measuring the current flow through said electrically conductive path when said electrode and said drill string are electrically connected, comprising means for measuring the potential across said resistor including a lock-in amplifier and a reference oscillator connected to both said switching means and said lock-in amplifier to interconnect said elements in a phased lock loop wherein voltage measurement across said resistor and interruption by said switching means are synchronized to eliminate noise, said current flow being indicative of the spontaneous potential of earth formations adjacent said electrode.

4,625,174
BATTERY AND BULB TESTER

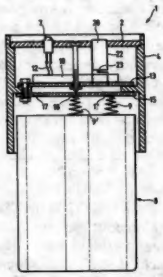
Walter Eberhart, Landvogt Waser Strasse 33, Winterthur, Switzerland

Filed Oct. 3, 1983, Ser. No. 538,424

Claims priority, application Switzerland, Oct. 5, 1982, 5853/82

Int. Cl.[4] H01M *45/06;* **G01R** *19/16*

U.S. Cl. 324—426 **4 Claims**



1. An apparatus for testing a battery and a bulb, said battery having a pair of terminals on one axial end thereof, one of said terminals being located generally centrally of said battery axial end and the other of said terminals being located in predetermined spaced relation away from said centrally located terminal, electrical means for measuring battery voltage and for indicating the voltage value measured, said apparatus comprising a casing, means to mount said electrical means inside said casing, an open cavity formed in said casing, said open cavity being defined by a support plate and a lateral side wall of said casing, said electrical means comprising a pair of contacts, means to mount said pair of contacts on said support plate facing into said open cavity, said pair of contacts comprising a first contact generally centrally located on said support plate and a second annular shaped contact arranged concentrically around said first contact, the spacing of said first and second contacts corresponding to said predetermined spaced relation of said first and second battery terminals, said casing lateral wall having a size and shape with respect to the size and shape of said axial end of a said battery to be inserted into said open

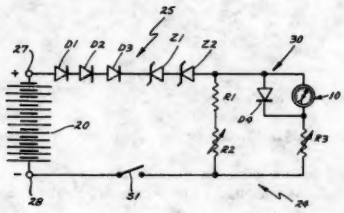
cavity that said battery terminals will contact said contacts in all possible orientations of said battery axial end as inserted into said open cavity, said casing comprising a front plate located in said casing in spaced relation to said support plate, socket means for testing a bulb, means to mount said bulb testing socket means in said front plate, means to mount said electrical battery voltage indicating means in said front plate, and means to electrically connect said bulb testing socket means to said pair of contacts, whereby the energy in a battery being tested is used to test a bulb put into said bulb testing socket means, whereby a battery and a bulb can be tested simultaneously, and whereby a bulb can be tested only when a battery is in said cavity in contact with said pair of contacts.

4,625,175

DEVICE INDICATING THE TIME REMAINING OF THE USEFUL LIFE OF A BATTERY

Leonard S. Smith, Richfield, Minn., assignor to Recreational Technologies Inc., Bloomington, Minn.

Filed Jul. 14, 1983, Ser. No. 513,604
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 324—430 **6 Claims**



1. A device for a battery in open circuit condition measuring in increments of time, the remaining useful life of a storage battery to the point of full discharge where the battery is used as a prime source of power, having in combination

a series circuit connected in parallel to a storage battery in an open circuit condition,

means included in said series circuit indicating the entire useful range of the open circuit voltage excursion of said battery on a full scale in increments of time, and

said means including means indicating in increments of time the remaining useful life of said battery for any particular use.

4,625,176

ELECTROSTATIC PROBE

James R. Champion, and Clarke A. Yeager, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 13, 1983, Ser. No. 531,565
Int. Cl.⁴ G01R *29/12*
U.S. Cl. 324—458 **5 Claims**

1. A probe device for measuring electrostatic surface potential comprising:

a multilayered piezoceramic bender element assembly comprising an inner conductive layer sandwiched between first and second piezoceramic layers, each piezoceramic layer having a conductive coating on its outer surface;

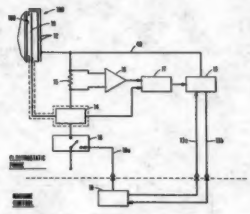
the conductive coating of said second piezoceramic layer divided into first and second electrically unconnected areas, the first area serving as part of a piezoelectric sense element and the second area serving as part of a piezoelectric feedback element, said first area electrically connected to said inner conductive layer to place both sides of said second piezoceramic layer at the same potential;

said first piezoceramic layer serving as a drive element to vibrate said bender element assembly;

a shield completely surrounding said bender element except for an opening on one side which enables said conductive sense element to be positioned in close proximity to a surface whose potential is to be measured, wherein said shield is comprised of an outer conductive layer, an inner conductive layer, and an insulative layer therebetween,

a high voltage source means for producing an output signal connected to the inner and outer layers of said shield;

said conductive sense layer connected to the inner layer of said shield;



a high impedance sense means connected between said inner and outer layers of said shield for producing a sense voltage thereacross proportional to current produced in said sense layer; and

circuit means connected to said high voltage source means and to said sense means for utilizing said sense voltage to vary the output signal of said high voltage source means until said sense voltage is effectively reduced to zero.

4,625,177

COMPLEX MICROWAVE SIGNAL GENERATOR

Larry J. Conway, Kanata, and William D. Cornish, Nepean, both of Canada, assignors to Her Majesty the Queen in Right of Canada, Ontario, Canada

Filed Oct. 9, 1984, Ser. No. 658,681
Claims priority, application Switzerland, Feb. 20, 1984, 448,079
Int. Cl.⁴ G11C *27/02;* H03B *21/00;* H03K *3/86*
U.S. Cl. 328—187 **6 Claims**

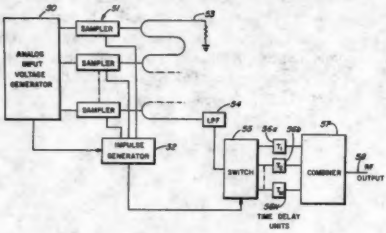
1. A method of generating complex r.f. signals comprising the steps of:

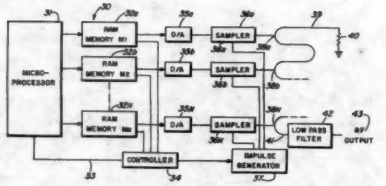
sending a number of input signals from signal generating means to a number df sampling means, said sampling means being connected to a number of predetermined points along delay line means;

initiating said sampling means to allow samples of said input signals to be transferred at predetermined time intervals to said delay line means; and

combining said samples at said delay line means in a time

series manner to form a single complex outout signal which is a combination of said number of input signals,





said complex output signal having predetermined variations of frequency, phase and amplitude.

4,625,178

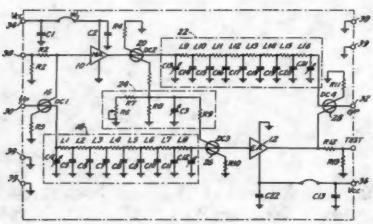
FEEDFORWARD GAIN BLOCK WITH MIRROR IMAGE ERROR AMPLIFIER

Leif R. Mannerstrom, North Vancouver, Canada, assignor to General Instrument Corporation, New York, N.Y.

Filed Jul. 19, 1985, Ser. No. 756,828

Int. Cl.[4] H03G *1/32*

U.S. Cl. 330—149 **14 Claims**



8. In a feedforward amplifier of the type having a main and an error amplifier, directional couplers, delay lines and attenuator means, the improvement comprising:

(a) said directional couplers, said delay lines and said attenuator means being disposed on a common circuit board;

(b) said main and said error amplifier being disposed separately from said common circuit board and being connected thereto by means of releasable connector means;

(c) said main and said error amplifiers being disposed on substrates with the electronic components thereof being constructed and arranged as mirror images of one another; and

(d) said common circuit board and said main and error amplifier being mounted within a housing of thermally conductive material with said amplifiers being disposed in heat conductive relation with said housing.

4,625,179

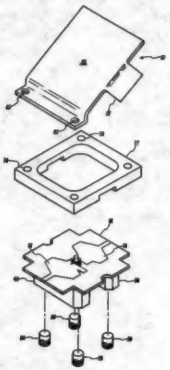
SPACE FEEDBACK APPARATUS FOR FIELD EFFECT TRANSISTORS

Ben R. Hallford, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 7, 1985, Ser. No. 784,975

Int. Cl.[4] H03F *1/38, 3/60*

U.S. Cl. 330—286 **4 Claims**



1. Enhanced signal amplifying apparatus comprising, in combination:

substrate means defining a plane, including first and second sides, having ground plane means attached to said first side;

solid state signal amplifying means including signal input means and signal output means mounted on said second side of said substrate means;

first signal network tuning means including signal field radiating means attached to said second side of said substrate means and electrically connected to said signal input means of said solid state signal amplifying means;

second signal network tuning means including signal field radiating means attached to said second side of said substrate means and electrically connected to said signal output means of said solid state signal amplifying means; and

space positive feedback means mounted at an angle with respect to said substrate means over said first and second signal network tuning means for perturbing the field radiated thereby and for increasing the gain in said signal amplifying apparatus.

4,625,180

INTERMITTENTLY OPERATED FREQUENCY SYNTHESIZER HAVING SUPPRESSED FREQUENCY INSTABILITY

Eiji Itaya, Kamakura; Takeshi Takano, Ushikumachi, and Takaharu Nakamura, Urawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 24, 1985, Ser. No. 813,139

Claims priority, application Japan, Dec. 28, 1984, 59-276319

Int. Cl.[4] H03L *7/18*

U.S. Cl. 331—2 **9 Claims**

1. A frequency synthesizer having a phase locked loop (PLL) which is operated intermittently, comprising:

first generating means for generating a reference frequency;

a first phase locked loop circuit including

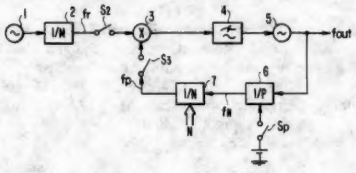
first oscillator means for providing an output frequency in accordance with a first control signal;

first frequency divider means for dividing the output frequency by a first integer and providing a comparison frequency;

first phase comparator means for comparing a phase relationship between the reference frequency and the comparison frequency and for providing a first difference signal varying in accordance with the phase relationship between the reference frequency and the comparison frequency; and

first loop filter means for filtering the first difference signal and for providing the first control signal to said first oscillator means;

first switch means for intermittently applying a supply voltage to said first frequency divider means such that said first frequency divider means operates intermittently;



phase correction switching means, operatively connected between said first phase comparator means and both of said first generating means and said first frequency divider means, for selectively providing the reference frequency and the comparison frequency to said first phase comparator means such that the phase relationship between the reference frequency and the comparison frequency is controlled so that the reference frequency and the comparison frequency are in phase during a time when said first switch means applies the power supply voltage to said first frequency divider means.

4,625,181

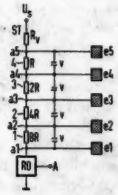
INTEGRATED SEMICONDUCTOR CIRCUIT WITH A RING OSCILLATOR

Helmut Bichler, Gräfelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,369

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401610

Int. Cl.[4] H03B 5/02

U.S. Cl. 331—57 **7 Claims**

1. Integrated semiconductor circuit with a ring oscillator having a frequency adjustable via an operating current of the ring oscillator, the ring oscillator having inverter cells which are connected in parallel with respect to the current supply of the ring oscillator, co-jointly with a current supply terminal thereof, via a variable resistance to a supply potential present in the current supply, comprising a voltage divider forming the variable resistance and including a plurality of series-connected resistors, said voltage divider having a plurality of terminals including an end terminal and a first and a second series of terminals which are connected alternatingly to one another said first series of alternating terminals beginning with a terminal immediately following said end terminal, and said second series of alternating terminals beginning with a terminal immediately following said terminal which immediately follows said end terminal, said end terminal connecting said voltage divider to a current supply terminal of the inverter cells of the ring oscillator and, additionally, to an externally addressable electrode, each terminal of said first series of alternating terminals of said voltage divider being likewise connected to another externally addressable electrode, respectively, of the integrated circuit and additionally connected via a respective diode to both terminals of said second series of alternating terminals located respectively adjacent thereto, said connecting diodes having respective anodes connected to respective terminals of said second series of alternating terminals, and having respective cathodes connected to a respective one of the two terminals of said first series of alternating terminals located adjacent thereto.

4,625,182

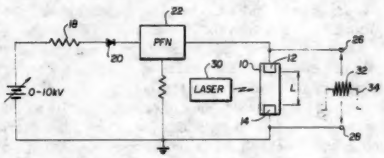
OPTICALLY TRIGGERED BULK DEVICE GUNN OSCILLATOR

Lawrence J. Bovino, Eatontown; Maurice Weiner, Ocean, and Terence Burke, New Brunswick, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 28, 1985, Ser. No. 791,672

Int. Cl.[4] H03B 9/12

U.S. Cl. 331—107 G **12 Claims**



1. A microwave/millimeter wave signal generator comprising:

a Gunn effect device comprised of material having an electrical resistivity greater than 1×10^7 ohm/cm and including a pair of ohmic contacts formed on the terminal ends thereof with the distance between said contacts defining a gap having a gap length of at least 0.5 millimeters;

means for applying a relatively high bias potential across said device for generating an electrical field thereacross which is substantially beyond the oscillation threshold of said device but wherein oscillations are inhibited in absence of optical energy impinging thereon due to the extremely high resistivity of the material of said device;

an optical source for periodically illuminating said device whereupon carriers are generated across said gap causing a reduction of the resistivity of the device which is accompanied by a decrease of the electrical field across the device to the oscillation threshold level, whereupon relatively high power RF oscillations appear across said ohmic contacts and whose frequency is determined by the recombination time of the carriers generated in said material by said optical source; and

means coupled across said ohmic contacts for sensing said RF oscillations.

4,625,183

LOW-COST VCO USING LUMPED ELEMENTS IN MICROWAVE BAND

John Ma, Milpitas, Calif., assignor to Capetronic (BSR) Ltd., Kowloon, Hong Kong

Filed Jun. 21, 1985, Ser. No. 747,657

Int. Cl.[4] H03B 5/20

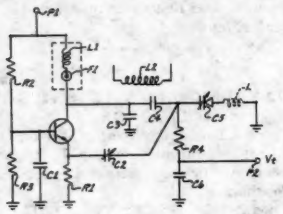
U.S. Cl. 331—117 R **18 Claims**

1. A voltage controlled oscillator (VCO) for a television

toner for tuning a large number of television channels, including signals in the microwave frequency range, said VCO comprising

a printed circuit (PC) board having a dielectric substrate, a patterned metal layer on one side of the substrate, and a substantially continuous metal layer forming a ground plane on the other side of the substrate,

a transistor mounted on the ground plane side of said PC board, and having emitter, base and collector leads projecting laterally from the transistor, the base of said transistor being connected to said ground plane,



a d-c supply circuit connected to said transistor,

a tuned circuit connected across the collector and emitter of said transistor, said tuned circuit including at least one ground connection to the ground plane of said PC board,

said d-c supply circuit, said tuned circuit, and said transistor having values which produce an oscillating output at a frequency of at least one GHz, and

said ground connections being interconnected by a continuous wide area of said ground plane to provide a short-distance, low-loss path for ground currents at the operating frequency of said VCO.

4,625,184

SURFACE ACOUSTIC WAVE DEVICE WITH IMPEDANCE MATCHING NETWORK FORMED THEREON

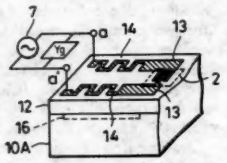
Teruo Niitsuma; Takeshi Okamoto, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,397

Claims priority, application Japan, Jul. 2, 1982, 57-115658; Jul. 2, 1982, 57-115659

Int. Cl.[4] H03H *9/25*

U.S. Cl. 333—150 **10 Claims**



1. A surface acoustic wave device which comprises:

a piezoelectric substrate which includes a semiconductor substrate and a piezoelectric film deposited on said semiconductor substrate, said semiconductor substrate including means defining a low resistance zone along a surface thereof having said piezoelectric film thereon;

transducer means provided on said piezoelectric substrate;

at least one pair of rectangular patterns of conductive film provided on said piezoelectric film and connected to said transducer means, said rectangular patterns being aligned with said low resistance zone; and

strip lines of conductive film provided on said piezoelectric film and each having an end which is connected to a respective one of said rectangular patterns, said strip lines being aligned with said low resistance zone;

said piezoelectric substrate, said low resistance zone, said rectangular patterns and said strip lines serving as a matching circuit which matches the electrical admittance of said surface acoustic wave device with the electrical admittance of an external circuit to be connected to ends of said strip lines remote from said rectangular patterns.

4,625,185

RESONANT CIRCUIT FOR THE EXTRACTION OF THE CLOCK FREQUENCY OSCILLATION FROM THE DATA FLOW

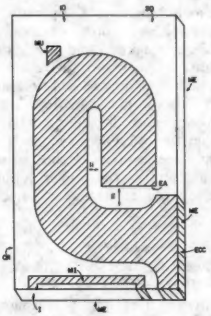
Giuseppe Burzi, Costamasnaga; Giovanni Mengoli, and Luciano Pogliani, both of Milan, all of Italy, assignors to Telettra, Telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed Mar. 16, 1984, Ser. No. 590,363

Claims priority, application Italy, Mar. 17, 1983, 20135 A/83

Int. Cl.[4] H01P *7/08*

U.S. Cl. 333—204 **4 Claims**



1. A resonant strip line circuit comprising:

a dielectric substrate having a first surface with predetermined length and width;

and electrically conductive strip disposed on said first surface and including a plurality of interconnected sections joined by bends in said strip, the total length of said strip being greater than each of said predetermined length and width;

input signal coupling means for electro-magnetically coupling input signals to said strip adjacent to said interconnected sections,

output signal coupling means for electro-magnetically coupling output signals, which is located adjacent from said strip at another of said interconnected sections;

said dielectric substrate being composed of quartz; and said conductive strip having a generally G-shaped configuration.

4,625,186

TWO-TERMINAL NEGATIVE ADMITTANCE NETWORK

Cornelis M. G. Zwarts, Gatineau, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Apr. 22, 1985, Ser. No. 725,999

Int. Cl.[4] H03H *11/00, 11/08*

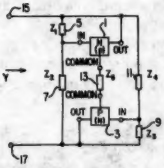
U.S. Cl. 333—216 **5 Claims**

1. An electrical network having a first and a second terminals and exhibiting a negative admittance between the terminals comprising:

a first electrical path between the terminals including a first

and a second impedance components Z_1 and Z_2 respectively, connected in series to each other,

a second electrical path between the terminals in parallel to the first path including a third and a fourth impedance components Z_3 and Z_4 respectively connected in series to each other, Z_1 and Z_4 being connected to the first terminal and Z_2 and Z_3 to the second terminal,



a first transistor connected in parallel with the first impedance component Z_1,

a second transistor of the type different from that of the first transistor connected in parallel with the third impedance component Z_3 and

a third electrical path including a fifth impedance component Z_5 and connecting the first and the second transistors.

4,625,187

RADIATING COAXIAL ELECTRIC CABLE

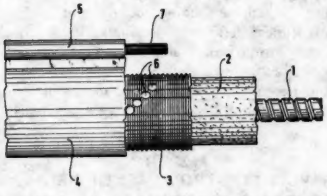
Jean-Loup Bocher, Ermont, France, assignor to Les Cables de Lyon, Clichy, France

Filed Sep. 17, 1984, Ser. No. 651,730

Claims priority, application France, Sep. 15, 1983, 83 14710

Int. Cl.[4] H01P 3/06

U.S. Cl. 333—237 **6 Claims**



1. A radiation coaxial electric cable comprising a conductor core (1), a cellular dielectric (2), a single, continuous outer conductor (3) having apertures for the passage of electromagnetic radiation, and an outer insulating sheath (4), wherein the radiation-passing apertures consist of successive series of circular holes (6) aligned according to helix pattern, thereby providing a radiating coaxial electric cable whose attenuation coefficient thereof is not dependent upon the value of the coupling factor, having better peak value radiation with more uniform distribution and for smaller coupling magnitudes than known cables and which permits excellent measuring of echo voltages.

4,625,188

PIVOTING JOINT FOR ULTRA-HIGH FREQUENCY WAVEGUIDES

Paul Bourgie, Paris, France, assignor to Thomson CSF., Paris, France

Continuation of Ser. No. 468,595, Feb. 22, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,663

Claims priority, application France, Mar. 5, 1982, 82 03732

Int. Cl.[4] H01P 1/06

U.S. Cl. 333—257 **3 Claims**

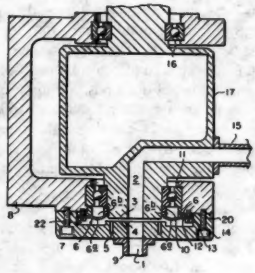
1. A pivoting joint joining rectangular ultra-high frequency waveguides through which ultra-high frequency radiation is guided, said joint comprising:

first and second rectangular waveguides;

a fixed-position frame establishing a frame axis;

connecting means for operatively interconnecting said first and second waveguides, said connecting means including (a) means defining an interconnecting waveguide of rectangular cross-section having first and second ends, (b) a planar face defined adjacent to said first end of said interconnecting waveguide perpendicular to said frame axis, said second end being aligned with and fixed to said second waveguide;

coupling means fixed to said frame in coaxial relationship to said frame axis, said coupling means including means defining an annular space to establish a central planar face in confronting, spaced-apart relationship to said first-mentioned planar face of said connecting means to define therewith a separation space, and an intermediate rectangular waveguide having one end which communicates with said first end of said interconnecting waveguide and another end which communicates with said first waveguide such that the cross-section of said intermediate waveguide at said another end is aligned with the cross-section of said first waveguide;



said connecting means also including means for pivotally mounting said connecting means to said frame for pivotal movements about said frame axis between (i) a stowed position wherein the cross-section of said interconnecting waveguide at its first end is misaligned with the cross-section of said intermediate waveguide at its one end and wherein the cross-section of said interconnecting waveguide at its second end remains aligned with the cross-section of said second waveguide, respectively, and (ii) an operative position wherein the cross-section of said interconnecting waveguide at its first and second ends is aligned with the cross-section of said intermediate waveguide at its one end;

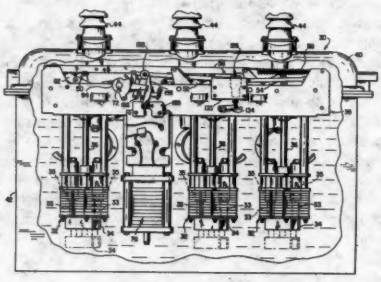
sealing means to seal said coupling means against radiation losses through said separation space, said sealing means including (i) at least one quarter-wave trap defined in said central planar face and surrounding said one end of said intermediate waveguide, and (ii) annular diaphragm means fixed to said frame and coaxial to said frame axis in opposing relationship to said annular space for perfecting, with said trap, sealing of said joint; and

wherein said diaphragm means is an annular ring having a planar outer portion and a convexly-curved inner portion.

4,625,189
CIRCUIT RECLOSER WITH ACTUATOR FOR TRIP, CLOSE AND LOCK OUT OPERATION

Lawrence W. Lazar, Elm Grove, and Ronald A. Wainio, South Milwaukee, both of Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 20, 1985, Ser. No. 778,358
Int. Cl.[4] H01H *75/00, 77/00, 83/00*
U.S. Cl. 335—10 **26 Claims**



1. In a circuit interrupter device including movable circuit contact means for interrupting current flow between said movable contact means and further contact means, a frame, operating mechanism on said frame for moving said movable contact means between a closed position and an open position, said operating mechanism including a latch for latching said movable contact means in a closed position, means for moving said operating mechanism to effect movement of said movable contact means to a contact open position upon tripping of said latch, and motor means operably connected to said operating mechanism for moving said movable contact means to a closed position, a control actuator for effecting tripping of said latch to move said movable contact means to an open position, said control actuator comprising:

an actuator member disposed in a first position and responsive to a control signal to move to a second position;

control linkage responsive to movement of said actuator member from said first position to said second position to effect tripping of said latch;

means for resetting said actuator member from said second position to said first position upon movement of said movable contact toward said open position; and

said means for resetting includes reset linkage interconnected between said actuator member and said operating mechanism and responsive to movement of said operating mechanism to reset said actuator member to said first position.

4,625,190
REMOTELY CONTROLLED SOLENOID OPERATED CIRCUIT BREAKER

John A. Wafer, Brighton Township, Beaver County, and Walter V. Bratkowski, McKeesport, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 4, 1985, Ser. No. 707,632
Int. Cl.[4] H01H *83/00*
U.S. Cl. 335—20 **8 Claims**

1. A circuit breaker for use in energy management systems, comprising:

an insulating housing having electrical terminals thereon;

separable contact means including a stationary contact member and a movable contact member disposed in the housing to form a circuit breaker path between the terminals;

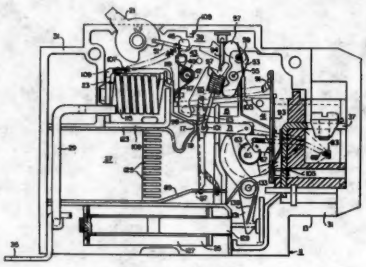
manual actuating means within the housing for operating the circuit breaker and including an operating lever and a releasing lever for opening and closing the movable contact member;

the actuating means also including an assist lever operable on the movable contact member and cooperable with the operating lever to close the contacts;

first electromagnetic means for actuating the movable contact member and energized by an electric pulse for opening or closing the circuit from a remote circuit;

coupling means between the electromagnetic means and the movable contact member;

the operating lever being positioned to prevent closing of the contacts by the first electromagnetic means when the manual actuating means is in an open-contact position;



the movable contact member comprising an overcenter toggle structure;

the operating lever and the assist lever cooperating to move the toggle structure overcenter to the closed-contact position; and

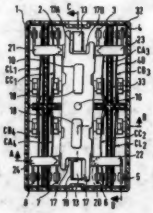
the operating lever and the assist lever being disposed on opposite sides of the toggle structure; and

the coupling means comprises a bistable toggle mechanism operable to move the movable contact member only when the manual actuating means is in the closed-contact position and the first electromagnetic means includes lever means for actuating the bistable toggle mechanism.

4,625,191
SAFETY ELECTROMAGNETIC RELAY

Johannes Oberndorfer, Hofsingelding, Fed. Rep. of Germany; Kenji Ono, Osaka, and Yoshiyuki Iwami, Obihiro, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 12, 1985, Ser. No. 754,306
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425889
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—78 **14 Claims**



1. An electromagnetic relay comprising

an excitation coil,

an armature adapted for movement in opposite directions

between an operative and an inoperative position in response to energization and de-energization of said coil,

first and second pairs of contact sets, each pair including a load-driving contact set and a control contact set, each contact set having a fixed contact and a movable contact, the movable contacts of one contact set in each of said first and second pairs being adapted to be positively displaced by said armature against resilient forces when the armature moves in one direction and to return due to said resilient forces when the armature moves in the other direction, and

first coupling means ganging the movable contacts of said first pair of contact sets and second coupling means ganging the movable contacts of said second pair of contact sets, each of said coupling means being movable independently of said armature at least when the armature moves from its operative position, in which said load-driving contact sets are closed, to its inoperative position.

4,625,192

SUPERCONDUCTING APPARATUS WITH IMPROVED CURRENT LEAD-IN

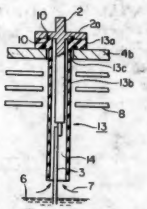
Takeo Kawaguchi, Akashi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,411

Claims priority, application Japan, Feb. 20, 1984, 59-28747

Int. Cl.[4] H01B *17/26, 17/36;* H01F *7/24*

U.S. Cl. 335—216 **1 Claim**



1. In a superconducting apparatus comprising a superconducting coil, a cryogenic fluid for cooling said coil, a vessel enclosing said superconducting coil and said cryogenic fluid, a current lead penetrating from outside into and being supported by said vessel and electrically connected to said superconducting coil and having a radially extending flange, the improvement comprising an insulating tube including an electrically insulating ring disposed around said current lead substantially coextensive with said flange between said vessel and said flange of said current lead outside of said vessel for electrically insulating between said current lead and said vessel, sealing rings for hermetically sealing between said ring and both said flange and said vessel, a hollow electrically insulating cylinder disposed around said current lead, and an electrically insulating cylindrical connection disposed between said insulating ring and said cylinder for integrally connecting said ring and said cylinder, thereby to substantially close any gap therebetween against electrical discharges therethrough; said ring, cylindrical connection and cylinder being formed as a unitary plastic member defining a sealed gas passage between said cylinder and said current lead for cooling said current lead.

4,625,193

MAGNET LEAD ASSEMBLY

John R. Purcell, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Jun. 4, 1984, Ser. No. 616,737

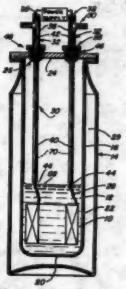
Int. Cl.[4] H01F *7/22*

U.S. Cl. 335—216 **10 Claims**

1. A lead assembly for providing an electrical connection between a first electrical device maintained at low temperature in a boiling liquid bath within a closed container and a second electrical device maintained at a higher temperature outside of said container, the lead assembly comprising:

a tube having an inlet end and an outlet end;

a length of cable which is superconducting at said low temperature and normally conducting at said higher temperature, extending through said tube and protruding therefrom at said inlet end;



means for positioning said tube with its inlet end within said container close to said bath and with its outlet end outside of said container so that vapor is vented from said boiling liquid bath through said tube to cool said length of cable near said inlet end so that said cable is superconducting near said inlet end.

4,625,194

A.C. CONTACTOR

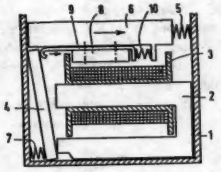
Kurt Held, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 766,166

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430363; Feb. 20, 1985, 3505881; Jun. 27, 1985, 3523051

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—271 **12 Claims**



1. An a.c. contactor including a magnetic system having an armature effectively connected with a return and a return spring loaded contact carrier onto which moving contact components of a contact system are mounted, comprising:

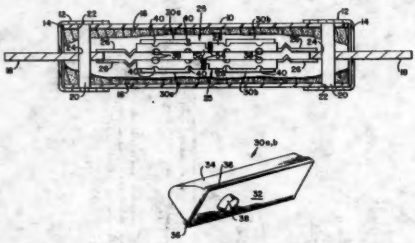
an auxiliary mass connected to and cooperating with the return spring loaded contact carrier effectively connecting to the armature by a coupling spring preventing a recoil return of the contact carrier.

4,625,195

ELECTRIC FUSE HAVING POSITIONING MEANS FOR ARC-QUENCHING CORE

Richard W. Robbins, Exeter, N.H., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 3, 1984, Ser. No. 677,125
Int. Cl.[4] H01H 85/04, 85/44
U.S. Cl. 337—159 4 Claims



1. An electric cartridge fuse comprising:

A. a tubular casing of electric insulating material;

B. a pair of electroconductive terminal elements closing the ends of said casing;

C. a ribbon fuse link conductively interconnecting said pair of terminal elements, said fuse link including a center section having a plurality of transverse lines of perforations and a plurality of longitudinal columns of perforations, said center section being bent into a substantially closed longitudinally extending channel defining one or more inwardly facing surfaces, and an outwardly facing peripheral surface;

D. means for evolving arc-quenching gasses under the heat of an electric arc, said gas evolving means being restrained within said longitudinally extending channel at a predetermined lateral position by engagement with said one or more inwardly facing surfaces of said channel;

E. means, comprising a protrusion from a lateral surface of said means for evolving gasses, for operatively engaging said longitudinally extending channel and axially fixing said means for evolving gasses with respect to said longitudinally extending channel; and

F. a pulverulent arc-quenching filler inside said casing surrounding said fuse link at all points thereof out of engagement with said gas evolving means.

4,625,196

MODULAR UNDER OIL EXPULSION FUSE CARTRIDGE ASSEMBLY

Frank J. Muench, Waukesha, and Gordon T. Borck, Cudahy, both of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed Jun. 24, 1985, Ser. No. 748,265
Int. Cl.[4] H01H 85/14
U.S. Cl. 337—204 10 Claims

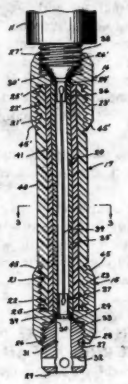
1. A modular under oil expulsion fuse cartridge assembly releasably connected to a holder assembly having holder contacts, comprising:

a tubular housing of non-electrical conductive material having a bore extending longitudinally therethrough;

an electrically conductive contact removably mounted on each end of said housing, said end contacts having a diameter greater than the diameter of said housing and having axially inner and outer ends;

ramp means at the inner end of each of said end contacts, said ramp means having a surface extending angularly outwardly relative to said housing toward said end contacts and engageable by holder contacts to ease insertion and removal from a holder assembly; and

a replaceable fuse assembly removably received within the bore of said housing, said fuse assembly including a fuse



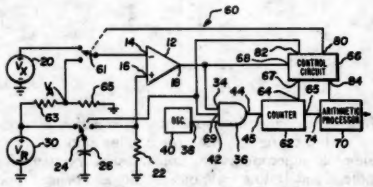
support tube and a fuse link supported within said tube electrically connected to each of said end contacts.

4,625,197

LOGARITHMIC ANALOG TO DIGITAL CONVERTER

Robert B. Holmes, Fairport, N.Y., assignor to Milton Roy Company, Petersburg, Fla.

Filed Sep. 28, 1984, Ser. No. 656,058
Int. Cl.[4] H03M 1/14, 1/10
U.S. Cl. 340—347 AD 13 Claims



1. A method for converting an analog input signal to a digital output signal equal to the logarithm of the ratio of said input signal to a reference signal comprising the steps of:

counting the cycles from a fixed frequency source for the time it takes to discharge a capacitor through a resistor from the reference signal to a calibration signal;

storing the result;

counting the cycles from said fixed frequency source for the time it takes to discharge said capacitor through said resistor from the reference signal to said input signal;

dividing the result by said stored result.

4,625,198

ALARM SYSTEM DIAGNOSTIC APPARATUS

Gary L. Williamson, North Palm Beach, and Oscar A. Williamson, Ft. Lauderdale, both of Fla., assignors to Self Diagnostic Security Devices, Inc., Riviera Beach, Fla.

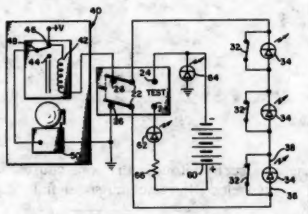
Filed Aug. 14, 1984, Ser. No. 640,655
Int. Cl.[4] G08B 29/00
U.S. Cl. 340—514 14 Claims

1. An alarm system, comprising:

a plurality of normally-closed electrical contacts wired in series with one another and further connected in series, when in an operating mode, with an alarm condition

annunciator, each of the contacts being mountable at a location to be monitored and adapted to be opened by occurrence by an alarm condition, the annunciator being operative upon an open-circuit condition at any of said plurality of contacts, the annunciator having electrical polarizing means defining a forward current direction for the series wired contacts in the operating mode;

a plurality of individual indicator means wired one each in parallel with each of said electrical contacts, the individual indicator means having an operational bias means defining an electrical polarity opposite the electrical polarity of the annunciator, whereby a forward current flowing through the series wired contacts will not activate any of the indicator means; and,



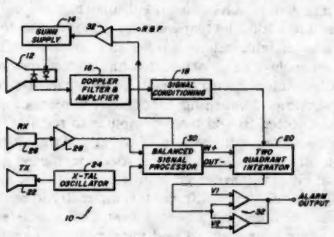
switch means operable in a test mode to disconnect the annunciator and apply to the series wired contacts a test voltage at a polarity opposite the electrical polarity of the annunciator and cause a reverse current to flow through the series wired contacts, whereby each of a plurality of electrical contacts then in said open-circuit condition is identified by activation of the individual indicator means wired in parallel therewith.

4,625,199

COMBINATION INTRUSION DETECTOR SYSTEM HAVING CORRELATED ULTRASONIC AND MICROWAVE DETECTION SUB-SYSTEMS

Math M. J. Pantus, Brunssum, Netherlands, assignor to American District Telegraph Company, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,156
Int. Cl.[4] G08B *19/00*
U.S. Cl. 340—522 **16 Claims**



1. An intrusion detector system, comprising:

first means for providing first and second motion detection signals in response to ultrasonic energy received from a protected volume that are respectively representative of motion in opposite directions;

second means for providing a third motion detection signal in response to microwave energy received from the protected volume; and

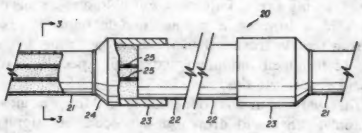
third means coupled to said first means and to said second means and operative in response to said first, to said second, and to said third motion detection signals for providing an alarm signal indication of intruder motion in the protected volume when at least one of said first and said second signals are simultaneously present with said third signal and when one of only one of said first and said second signals is correlated with said third signal.

4,625,200

HEAT DETECTION SYSTEM

Howard L. Hilborn, Houston, and Michael Strebel, Pasadena, both of Tex., assignors to Gay Engineering & Sales Co., Inc., Pasadena, Tex.

Filed Jan. 10, 1985, Ser. No. 690,316
Int. Cl.[4] G08B *17/06*; G01K *1/14*
U.S. Cl. 340—596 **2 Claims**



1. A heat detection system for monitoring the temperature of a storage tank, said system comprising:

thermocouple cable means adapted to be positioned adjacent said tank means for generating an emf as a function of the temperature above a threshhold level occurring along the length of said thermocouple cable means, said cable means including;

(a) alternating cable sections of

(1) a first pair of spaced thermoelement wires of dissimilar material within a tubular sheath, the interior of said sheath being packed with a first material having a negative resistance temperature coefficient, and

(2) a second pair of spaced thermoelement wires of dissimilar material within a tubular sheath, the interior of said sheath being packed with a second material other than said first material;

said second material not having a negative resistance temperature coefficient;

(b) transition means intermediate each said adjoining cable section for joining said first and second pairs of wires, thereby forming continuous first and second wire lengths;

means for generating a first warning signal when said temperature exceeds said threshhold level, and

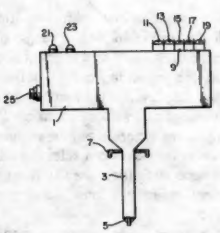
means for generating a second warning signal as a function of a discontinuity in any of said wires.

4,625,201

EMERGENCY BATTERY CELL MONITOR

Robert J. Berry, 14 Friar Rd., Morris Plains, N.J. 07950

Filed Sep. 24, 1984, Ser. No. 653,894
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—636 **9 Claims**



1. A wet cell battery monitor for single cell monitoring of

both electrolyte fluid level and electrolyte fluid charge, which comprises:

(a) a conductive probe adapted for insertion into a single cell of a wet cell battery to a predetermined depth, said predetermined depth corresponding to a minimum acceptable electrolyte fluid level contained within said single cell, said probe further adapted to function conductively when inserted when said electrolyte fluid level is at or above said minimum acceptable electrolyte fluid level and to function nonconductively when said electrolyte fluid level is below said minimum acceptable electrolyte fluid level;

(b) a first circuit connectively related to said probe, said first circuit having a first resistor of a predetermined resistance and having a relay induction coil switching means precalibrated to drop out in response to a decrease in the current from the electrolyte fluid through the probe, based on a predetermined minimum acceptable specific gravity of said electrolyte fluid;

(c) first warning means connected to said first circuit so as to indicate that said drop out has occurred, signifying a decrease of the electrolyte specific gravity below said predetermined minimum acceptable specific gravity;

(d) a second circuit connectively related to said first circuit, said second circuit having a second resistor of a predetermined resistance and a second relay induction coil switching means precalibrated to drop out in response to a change in the current from said probe from functioning conductively to functioning non-conductively as the result of said electrolyte fluid level falling below said minimum acceptable electrolyte fluid level;

(e) second warning means connected to said second circuit so as to indicate that said drop out has occurred, signifying an electrolyte fluid level below said minimum acceptable electrolyte fluid level;

(f) a blocking diode connected to at least one of said first and second circuits so as to assure independent and distinct functioning of each of said first and second circuits;

(g) a reset means electrically connected to said first and second circuits so as to enable the resetting of said switches after a drop out has occurred; and,

(h) a terminal block connectively related to said first and second circuits so as to be capable of functional connection to said battery being monitored and to any power source desired.

4,625,202

APPARATUS AND METHOD FOR GENERATING MULTIPLE CURSORS IN A RASTER SCAN DISPLAY SYSTEM

Scott C. Richmond, Mulino, and James R. Peterson, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

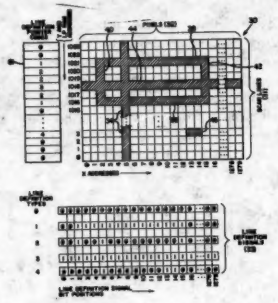
Filed Apr. 8, 1983, Ser. No. 483,353
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—709 **13 Claims**

1. An apparatus for generating cursors in a multidimensional display system, each dimension having a range of addresses corresponding to locations therein, said apparatus comprising:

(a) definition means for providing cursor definition signals for scan lines in a display, each cursor definition signal being representative of at least one location along a scan line in a first dimension where a cursor occurs;

(b) generation means responsive to a selected cursor definition signal from said definition means for generating a cursor video signal defining a line of a display where a cursor occurs; and

(c) line definition pointer code means responsive to addresses in a second dimension for selecting the one of said cursor definition signals to which said generation means responds, the number of said cursor definition signals being less than the number of addresses in said second



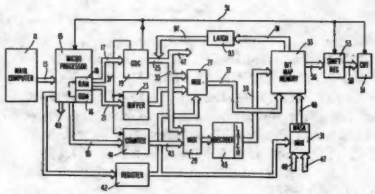
dimension such that more than one address in the second dimension selects the same cursor definition signal.

4,625,203

ARRANGEMENT FOR PROVIDING DATA SIGNALS FOR A DATA DISPLAY SYSTEM

Robert S. DiNitto, Chelsea; Thomas C. Porcher, Stow; John W. Eng, Southborough; Charles S. Namias, Burlington, and David B. Hughes, Hudson, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 18, 1983, Ser. No. 543,107
Int. Cl.[4] G09G *1/14*
U.S. Cl. 340—750 **8 Claims**



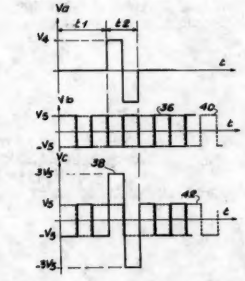
1. In a system which has a CRT display means for displaying text characters and a bit map memory means connected thereto to store pixel information for transfer to said CRT display means, an arrangement for accelerating data signals representing text characters from a main computer means to said bit map memory means comprising in combination: microprocessor means connected to said main computer to receive therefrom instruction signals, address signals and coded signals representing text characters, said microprocessor means providing groups of bit signals arranged in different positions, each group of bit signals defining a different text character to be displayed, in response to receiving different groups of said coded signals; buffer means connected to said microprocessor means to receive said groups of bit signals and store the same for further transmission in parallel; first circuitry means connecting said buffer means to said bit map memory means for transmitting said groups of bit signals in parallel from said buffer means to said bit map memory means; controller circuitry means connected to said microprocessor means to receive address signals and instruction signals therefrom; second circuitry means connecting said controller circuitry means to said bit map memory means to provide address signals and instruction signals thereto to direct said different groups of bit signals to particular locations in said bit map memory and alternatively to cause said bit map memory means to read out pixel information from certain locations to said CRT display means.

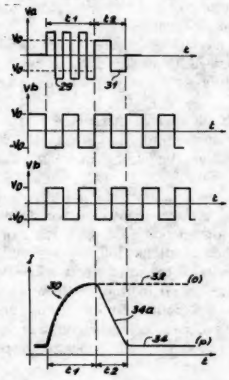
4,625,204

SEQUENTIAL CONTROL PROCESS FOR A MATRIX DISPLAY

Jean F. Clerc, Meylan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 1, 1984, Ser. No. 575,791
Claims priority, application France, Feb. 24, 1983, 83 03047
Int. Cl.[4] G09G 3/36
U.S. Cl. 340—784 9 Claims





1. A sequential control process of a matrix display using the cholesteric-nematic phase transition effect of a liquid crystal interposed between a first group of p rows of parallel electrodes and a second group of q columns of parallel electrodes, said rows and said columns intersecting one another, an area x_iy_j of said liquid crystal being defined by a region of said liquid crystal covered by row x_i, in which i is an integer such that $1 \leqq i \leqq p$, and by the column y_j, in which j is an integer such that $1 \leqq j \leqq q$, said rows and columns being used for carrying electrical signals acting on said phase transition, one of said two phases corresponding to the displayed state and the other to the undisplayed state, said liquid crystal having a low threshold voltage V_B which is a maximum voltage for obtaining the cholesteric form, and a high threshold voltage V_H which is a minimum voltage for obtaining the nematic form with $0 < V_B < V_H$, wherein:

(A) in order to obtain one of the two states of area x_iy_j, the process comprises,

(1) applying a first potential V_1 to column y_j for a time t_1 equal to $s\tau$, in which τ is a time interval useful for control purposes and s is an integer, said first potential V_1, having a value higher than the high threshold voltage V_H,

(2) applying just after step (1), a second potential V_2 to said column y_j for time t_2 equal to τ, the other columns receiving a zero potential,

(3) applying a third potential V_3 to row x_i, said potentials V_2 and V_3 having during time t_2, phases and values such that the sum V_2+V_3 exceeds the high threshold voltage V_H for obtaining the displayed state and the difference V_2-V_3 is lower than the low threshold voltage V_B for obtaining the undisplayed state; and alternatively

(B) in order to maintain one of the two states, of area x_iy_j, the process comprises,

(1) applying a zero potential to row x_i during time t_1,

(2) applying just after step (4), a fourth potential V_4 to said row x_i during time t_2, the other rows receiving a zero potential,

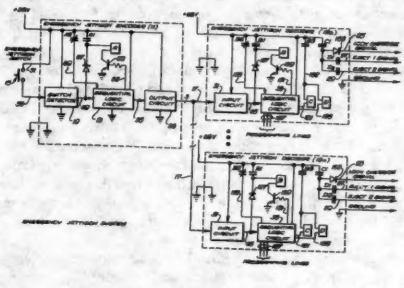
(3) applying a fifth potential V_5 to column y_j, said potentials V_4 and have V_5 having during time t_2 phases and values such that the sum V_4+V_5 exceeds the low threshold voltage V_B for maintaining the displayed state and the difference V_4-V_5 is lower than the high threshold voltage V_H for maintaining the undisplayed state.

4,625,205

REMOTE CONTROL SYSTEM TRANSMITTING A CONTROL PULSE SEQUENCE THROUGH INTERLOCKED ELECTROMECHANICAL RELAYS

Matthew J. Relis, Teaneck, N.J., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 8, 1983, Ser. No. 559,390
Int. Cl.[4] H04Q 1/00
U.S. Cl. 340—825.66 32 Claims



1. A remote control system comprising:

controller means for producing a predetermined sequence of control pulses;

switch means for controllably actuating the controller means;

remote means for counting the individual pulses in the sequence of control pulses and for performing a predetermined function when a selected count is reached; and

transmission means for transmitting the sequence of control pulses from the controller means to the remote means, the transmission means including

a first electromechanical relay actuated by the sequence of control pulses produced by the controller means, and

a second electromechanical relay actuated by the switch means,

wherein the respective first and second electromechanical relays are connected together to transmit the sequence of control pulses to the remote means only if both relays have been actuated, whereby, if the switch means has not controllably actuated both the controller means and the second relay, one or more failures in any portion of the controller means cannot cause the transmission means to transmit an undesired control pulse to the remote means.

4,625,206

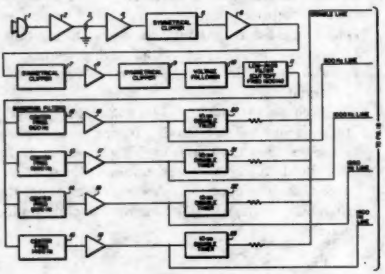
SOUND PATTERN DISCRIMINATION SYSTEM

Marten C. Jensen, Scottsdale, Ariz., assignor to Richard W. Clark, Scottsdale, Ariz., a part interest

Continuation-in-part of Ser. No. 365,548, Apr. 5, 1982, abandoned. This application Mar. 27, 1984, Ser. No. 593,810

Int. Cl.[4] G08G *1/00*

U.S. Cl. 340—902 7 Claims



1. A sound discrimination system for use in an environment subject to a plurality of sounds of various frequencies and combinations of frequencies, said system including in combination:

first amplifier means having first and second inputs;

first and second diametrically opposed sound pickup means differentially connected to the first and second inputs of said first amplifier means to permit passage of signals from said first and second sound pickup means therethrough in response to a difference in signal strength from said first and second sound pickup means greater than a predetermined amount;

second amplifier means having first and second inputs;

third and fourth diametrically opposed sound pickup means arranged on a line at an angle to a line between said first and second sound pickup means, said third and fourth sound pickup means being differentially connected to first and second inputs of said second amplifier means to permit passage of signals from said third and fourth sound pickup means therethrough whenever the signal strength from said third and fourth sound pickup means differs by more than a predetermined amount;

first and second processing circuits connected, respectively, to the outputs of said first and second amplifier means, each of said processing circuits comprising:

(a) a plurality of means for selectively detecting and recognizing predetermined sound signals at different frequencies within the audio frequency spectrum of said particular sound pattern, each of said sound detecting and recognizing means producing an output signal in response to such detection and recognition of said second sound signal;

(b) control means for producing an output control signal for said system in response to receipt of a signal on the input thereof;

(c) a plurality of time delay circuit means each coupled with the output of a different corresponding one of said detecting and recognizing means for producing an enable signal ater a predetermined time delay, each of said time delay circuit means coupled with the next one of said time delay circuit means in the sequence for producing an enable signal thereto in a predetermined sequence, with the output of the last time delay circuit means coupled with said input of said control means; and

(d) means interconnecting said control means in each of said channels with one another for preventing operation of said control means from said second channel when said first channel control means is operated and vice-versa.

4,625,207

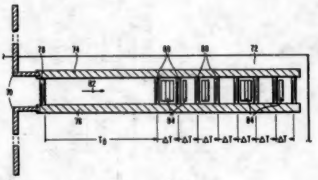
SURFACE ACOUSTIC WAVE PASSIVE TRANSPONDER HAVING AMPLITUDE AND PHASE-MODIFYING SURFACE PADS

Halvor Skeie, San Jose, Calif., assignor to X-Cyte Inc., Mountain View, Calif.

Filed Jun. 30, 1983, Ser. No. 509,526

Int. Cl.[4] G01S *13/80;* H03H *9/68, 9/145*

U.S. Cl. 342—51 10 Claims



1. In a passive transponder adapted for use in an interrogation system for transmitting a reply signal containing coded information in response to the receipt of an interrogating signal, said transponder comprising:

(a) a substrate having a substrate surface defining a plurality of paths of travel for surface acoustic waves, each path of travel having a different length from its beginning to its end; and

(b) electric circuit means, disposed on said substrate, for propagating surface acoustic waves along said paths of travel, from said beginning of each path to said end thereof;

the improvement comprising a plurality of selectively removable surface acoustic wave delay pads of prescribed width disposed on the surface of said substrate at prescribed locations along a plurality of said paths of travel to increase the surface acoustic wave propagation time by prescribed increments from said beginning of each of said plurality of paths to said end thereof, the number of said pads in each travel path determining said increase in acoustic wave propagation time along that path,

whereby the number of said pads in each travel path may be selected to impart said coded information to said reply signal.

4,625,208

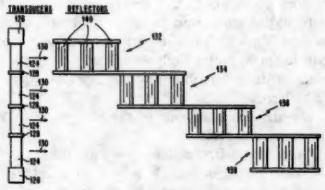
SURFACE ACOUSTIC WAVE PASSIVE TRANSPONDER HAVING ACOUSTIC WAVE REFLECTORS

Halvor Skeie, San Jose, and Paul A. Nysen, Sunnyvale, all of Calif., assignors to X-Cyte Inc., Mountain View, Calif.

Filed Jun. 30, 1983, Ser. No. 509,527

Int. Cl.[4] G01S *13/80;* H03H *9/145, 9/72*

U.S. Cl. 342—51 18 Claims



1. In a passive transponder adapted for use in an interrogation system for transmitting a reply signal containing coded

information in response to the receipt of an interrogating signal, said transponder comprising:

(a) an antenna for converting between electrical energy and electromagnetic energy;

(b) a substrate having a substrate surface defining a plurality of paths of travel for surface acoustic waves;

(c) transducer means, electrically connected to said antenna and arranged on said substrate surface, for converting between electrical energy and surface acoustic wave energy which propagates along said paths of travel, said transducer means comprising a plurality of transducer elements, electrically connected together, for converting said interrogation signal into surface acoustic wave energy, each one of said transducer elements being responsive to produce surface acoustic waves within a specified frequency band upon application of an interrogating signal having a frequency within such band, the frequency bands of at least two different transducer elements being exclusive of each other so that an interrogating signal of a given frequency will excite a specific one of said transducer elements;

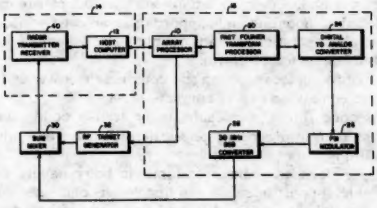
(d) a plurality of acoustic wave reflectors arranged on said surface along said paths of travel for reflecting said surface acoustic wave energy back toward said transducer means, said paths of travel extending in at least one direction from said transducer means along at least one common line, wherein said reflectors are arranged along said common line and wherein at least one of said reflectors, closest to said transducer means, reflects only a portion of the acoustic wave energy received, thereby to permit a portion of said acoustic wave energy to pass beneath said one reflector to reach the next reflector along said common line; and

(e) circuit means, connected to said transducer means, for supplying said interrogating signal to said transducer means and for receiving said reply signal from said transducer means.

4,625,209
CLUTTER GENERATOR FOR USE IN RADAR EVALUATION

Gene W. Lawrence, Spokane, Wash., and Thomas L. Davis, Carrollton, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 26, 1984, Ser. No. 624,846
Int. Cl.⁴ G01S 7/40
U.S. Cl. 342—169 **2 Claims**



1. A clutter generator for testing the dynamic output of a radar system comprising:

memory means, said memory means containing digital data defining discrete terrain echo characteristics,

first and second signal processors being interconnected and receiving radar system dynamic operating parameter signals and clutter pattern digital data and generating therefrom complex digital signals, wherein said first signal processor performs the function of receiving the operating characteristics of said radar system and said digital data defining a discrete preselected clutter pattern from said memory means, said first signal processor generating the complex discrete Fourier transform of terrain echo returns, and said second signal processor performs an inverse Fast Fourier transform on said complex discrete Fourier transform of terrain echo returns produced by said first signal processor, said second signal processor producing real-time digital clutter signals simulating the terrain echo returns said radar system would experience from the terrain described in said memory means,

digital/analog converter means converting said complex digital signals to analog clutter signals,

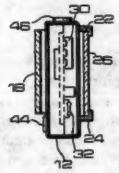
mixer means converting said analog clutter signals to RF frequency analog clutter signals, and

a balancing circuit for preprocessing the output of said digital/analog converter means for use by said mixer means.

4,625,210
CONSTRUCTION FOR A PORTABLE RADAR DETECTOR HAVING A MIRROR

Rudolf J. C. Sagl, Rockwood, Canada, assignor to B.E.L-Tronics Limited, Mississauga, Canada

Filed May 21, 1984, Ser. No. 612,090
Claims priority, application Canada, Mar. 27, 1984, 450633
Int. Cl.⁴ G02B 7/18
U.S. Cl. 342—20 **8 Claims**



1. A radar detector assembly for portable installation in an automotive vehicle, having a body with a front face and a back face, and a first mirror on a substantial portion of the front face with a minor portion of the front face being not covered by a mirror;

said body having fastener means at the back face thereof for said body to be detachably attached to a mirror permanently installed in said automotive vehicle;

a microstrip antenna for said radar detector being within said body and behind said minor portion of said front face; and other electrical circuit components of said radar detector being within said body and behind said first mirror on said substantial portion of said front face;

said fastener means being arranged so that when said body is detachably attached to said vehicle mirror, said other electrical circuit components of said radar detector are forward of said vehicle mirror, and said microstrip antenna is positioned so as not to be forward of said vehicle mirror;

said vehicle mirror and said first mirror on said front face of said radar detector body being each substantially opaque to microwave and intermediate frequency transmissions;

and said body at said minor portion of said front face and at the rear face behind said minor portion being substantially transparent to microwave frequency transmissions;

whereby said microstrip antenna has substantially unobstructed front and rear exposure to microwave frequency transmissions, and said other electrical circuit components are substantially shielded to microwave and intermediate frequency signals at the front and rear by said first mirror on said front face of said radar detector body and by said vehicle mirror.

4,625,211
ADAPTIVE ANTENNA ARRAY

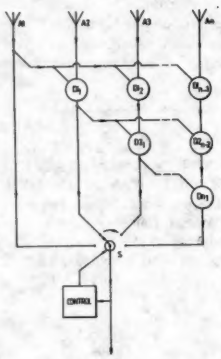
Jeffrey G. Searle, Stanstead Mountfitchet, and Christopher R. Ward, Bishops Stortford, both of United Kingdom, assignors to Standard Telephone and Cables plc, London, England

Filed Jun. 4, 1984, Ser. No. 617,248

Claims priority, application United Kingdom, Jun. 18, 1983, 8316658

Int. Cl.[4] H01Q *3/24*; G01S *3/16*

U.S. Cl. 342—374 **1 Claim**



1. A multiple output, power inversion adaptive antenna array comprising a plurality of antenna elements connected by decorrelation stages arranged in groups each group including one less decorrelation stage than the preceding group and the first group including one less stage than the number of antenna elements, each stage of the first group being connected to receive as a main signal a signal from a different one of the antenna elements and as an auxiliary signal the signal from the remaining element and to provide an output signal and each decorrelation stage of each subsequent group being connected to receive as a main signal an output signal from a respective decorrelation stage of the preceding group and as an auxiliary signal the remaining output signal from the preceding group and to provide an output signal whereby each group has one predetermined decorrelation stage the output signal of which is decorrelated with respect to one or more of all except one of the antenna element input signals, the array including scanning means whereby the outputs of the predetermined one stage of each group are scanned in succession beginning with that of the first group and control means responsive to the detection of scanned output signals having predetermined criteria to control the scanning means and to halt scanning of the outputs when said predetermined criteria are attained.

4,625,212
DOUBLE LOOP ANTENNA FOR USE IN CONNECTION TO A MINIATURE RADIO RECEIVER

Takashi Oda, and Koji Yamasaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,617

Claims priority, application Japan, Mar. 19, 1983, 58-45315; Mar. 19, 1983, 58-45316

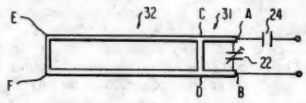
Int. Cl.[4] H01Q *1/24*

U.S. Cl. 343—702 **5 Claims**

1. An antenna for use in connection with a reactance circuit in a miniature radio receiver, comprising:

a first antenna element having a first pair of ends, a first conductive path which is connected to said first pair of ends and which has a first predetermined reactance, and a first predetermined aperture area determined by a first loop formed by said first conductive path and said reactance circuit when said reactance circuit is connected to said first pair of ends;

a second antenna element having a second pair of ends connected in common to said first pair of ends, a second conductive path which is connected to said second pair of ends and which has a second predetermined reactance greater than said first predetermined reactance, and a second predetermined aperture area which is determined by a second loop formed by said second conductive path



and said reactance circuit when said reactance circuit is connected to said second pair of ends and which is greater than said first predetermined aperture area; and

said antenna having an antenna aperture area substantially specified by said second predetermined aperture area and a antenna reactance given by a combination of said first and said second predetermined reactances,

whereby said antenna is adapted to receive high frequency signals with high gain.

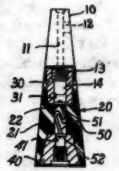
4,625,213
ANTENNA MOUNT

Dale W. Horn, Brecksville, Ohio, assignor to Orion Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 228,938, Jan. 28, 1981, abandoned. This application Nov. 30, 1984, Ser. No. 676,630

Int. Cl.[4] H01Q *1/32*

U.S. Cl. 343—715 **16 Claims**



1. A mobile communications antenna coupler-mount for deflectably mounting and supporting an antenna whip, usable for duplex operation, and for coupling said antenna whip to a lead-in conductor comprising:

a first fitting for receiving and coupling the lower end of the antenna whip to said coupler-mount;

a second fitting coupleable to the lead-in conductor, said second fitting being physically spaced from said first fitting;

a one-piece, insulating, elastometric body having deflectable, support sidewalls and first and second ends, said first fitting being received in said first end, with said second fitting being received in said second end and insulated from said first fitting, said first fitting being deflectable with said first end from an initial position of rest relative to said second fitting, said insulating body providing the sole restoring force to return said first fitting from a deflected position to said initial position of rest, said body defining a deformable space of a selected shape and length between said fittings, said first fitting and the antenna whip being supported in spaced relation to said second fitting only by said support sidewalls; and

an elongated, flexible, conducting member positioned in said space, said conducting member being mechanically connected to said fittings, and being electrically coupleable at

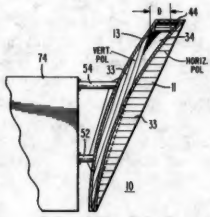
said fittings to an antenna whip and a lead-in conductor, thereby to provide a noise-free electrical connection between the antenna whip and said second fitting as said elastomeric body is deflected.

4,625,214

DUAL GRIDDED REFLECTOR STRUCTURE

Sharad V. Parekh, Robbinsville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 15, 1984, Ser. No. 661,163
Int. Cl.[4] H01Q *19/195*
U.S. Cl. 343—756 **11 Claims**



1. A method for constructing a dual grid antenna reflector system of the type comprising a pair of polarized reflector dishes each having generally parallel oriented conductors with one of the reflector dishes to be mounted over the other dish in a spaced fashion using support ribs, such that the orientation of the conductors of the overlapped reflector is aligned with a desired linearly polarized radiation source and is orthogonal to of that of the conductors of the other reflector, comprising the steps of:

establishing the anticipated electric field distribution across the aperture of the overlapped reflector dish from the desired linearly polarized radiation source and

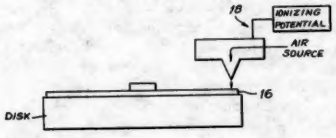
placing the support ribs such that they are either parallel to and/or perpendicular to the orientation of the conductors of the overlapped reflector dish and such that they are substantially outside the established high field region.

4,625,215

OPTICAL STORAGE STRUCTURE

Boris J. Muchnik, and Fred W. Spong, both of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jul. 6, 1984, Ser. No. 628,200
Int. Cl.[4] G01D *15/14, 15/34*
U.S. Cl. 346—25 **7 Claims**



1. An information storage device in combination with a radiation recording structure, said recording structure comprising:

(a) a disk shaped substrate for providing support;

(b) a planarizing layer on said substrate for providing an optically flat surface;

(c) a reflective layer deposited on said planarizing layer;

(d) a three layer structure comprised of a fluorocarbon phase layer on said reflective layer, an active layer on said phase layer, and a fluorocarbon matrix layer on said active layer, said active layer being encapsulated between said phase layer and matrix layer, said active layer comprising globules of a tellurium, selenium and arsenic alloy;

(e) a thin transparent electrically conductive over-layer on said matrix layer, said over-layer being optically transparent to said read and write beams; and

said information storage device including focused radiation beams for writing and reading on recording structures and comprising:

(a) neturalizing means for maintaining said overlayer at a neutral electrical potential,

said recording structure when installed in said information storage device being subject to writing and reading by said focused beams, electrical charges on said over-layer being subject to neutralization by said neturalizing means.

4. An information storage device in combination with a radiation recording structure, said recording structure comprising:

(a) a substrate for providing support;

(b) a multi-layered structure supported on said substrate, said multi-layered structure including at least one active layer subject of modification by said write radiation beam;

(c) a thin electrically conductive over-layer on said multi-layer structure, said overlayer forming the outer surface of said recording structure,

said information storage device including focused radiation beams for writing and reading on recording structures and comprising;

(a) neutralizing means for maintaining said over-layer at a neutral elecrical potential,

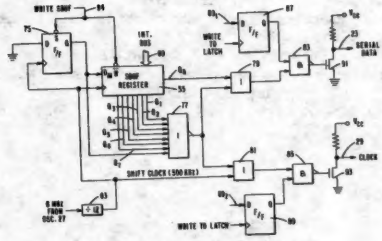
said recording structure when installed in said information storage device being subject to writing and reading by said focused beams, electrical charges on said over-layer being subject to neutralization by said neutralizing means.

4,625,216

THERMAL PRINTHEAD LIFE EXTENSION TECHNIQUE

Ralf M. Brooks, and Brian P. Connell, both of Waterloo, Canada, assignors to NCR Canada Ltd., Mississauga, Canada

Filed Aug. 5, 1985, Ser. No. 762,737
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **9 Claims**



1. A thermal printing system for printing on documents, said system comprising:

an array of thermal elements;

means for producing serial data representative of a line of multiple character segments to be printed, said serial data having a preselected number of character positions selectively associated with said thermal elements;

means responsive to said serial data for enabling said array of thermal elements to thermally print a line of character segments on an associated document in accordance with said serial data;

means for determining an associated different position control value for each successive document to be printed; and

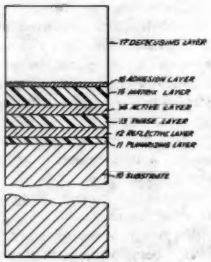
means responsive to said position control value for enabling

said producing means to shift for each document the position of said serial data with respect to said thermal elements by a number of positions equal to said associated position control value.

4,625,217
BROAD BAND MULTILAYER OPTICAL STORAGE STRUCTURE HAVING A THIN METALLIC OPTICALLY TRANSMISSIVE LAYER

Fred W. Spong, and Boris J. Muchnik, both of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jul. 6, 1984, Ser. No. 628,357
Int. Cl.[4] G01D *9/00, 15/10*
U.S. Cl. 346—76 L **2 Claims**

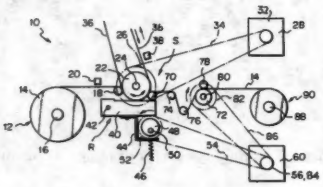


1. An optical recording structure layer having an optical reflecting layer, a phase layer on said reflective layer, an active layer on said phase layer and a matrix layer on said active layer, said phase layer and matrix layer being substantially transparent to radiation; the improvement comprising a metal layer on said matrix layer, said metal layer having a thickness from 20 to 100 Angstroms.

4,625,218
DRIVE MECHANISM FOR THERMAL TRANSFER TYPE LINE RECORDER

Tetsuo Watanabe, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 791,066
Claims priority, application Japan, Oct. 29, 1984, 59-227324
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **10 Claims**



1. A thermal transfer type line recording apparatus comprising:

(a) a platen rotatable in a first direction and in a second direction opposite to the first direction;

(b) first means for passing a paper over said platen;

(c) second means for superposing an ink sheet over the paper as it passes over said platen;

(d) a thermal head mounted for movement back and forth between an inoperative position spaced from said platen and an operative position in which it presses the superposed paper and ink sheet against said platen to record a line of data on the paper by thermal transfer;

(e) a first reversible indexing drive motor rotatable in a first direction and in a second direction opposite to the first direction, said first reversible indexing drive motor being operably connected to said platen for rotating said platen in its first direction while multiple lines of data are printed on the paper in one color and for rotating said platen in its second direction so that multiple lines of data may be printed on the paper in another color;

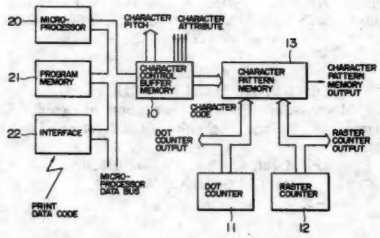
(f) a second reversible indexing drive motor rotatable in a first direction and in a second direction opposite to the first direction; and

(g) third means operably connecting said second reversible indexing drive motor both to said second means and to said thermal head so as to move said thermal head back and forth between its operative and its inoperative positions and so as to index the ink sheet relative to said platen while said thermal head is in its inoperative position.

4,625,219
VIDEO SIGNAL GENERATING APPARATUS FOR LASER BEAM PRINTER

Yuichi Horiuchi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,438
Claims priority, application Japan, Nov. 11, 1983, 58-210775
Int. Cl.[4] C01D *9/42, 15/14;* **H01N** *1/10*
U.S. Cl. 346—108 **6 Claims**



1. In a video signal generating apparatus for a laser beam printer, comprising a character control buffer memory for storing codes and attributes of characters, a dot counter for counting the dots along a horizontal side of a character, a raster counter for counting the dots along a horizontal side of a character, a raster counter for counting the dots along a vertical side of the character, and a character pattern memory for selecting a character pattern and reading dot data in response to outputs from said dot counter and said raster counter, the improvement further comprising comparator means for comparing a value representing the size of a ruled line in the number of dots thereof with an output value of said dot counter and also with an output value of said raster counter, and combining means for combining outputs of said comparator means and the output of said character pattern memory to output a video signal which includes character dots and ruled line dots.

4,625,220

MONITORING APPARATUS FOR LIQUID JET RECORDING HEAD

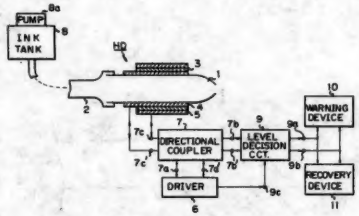
Yoshitake Nagashima, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1984, Ser. No. 667,364

Claims priority, application Japan, Nov. 10, 1983, 58-173818[U]

Int. Cl.[4] G01D *15/16;* H01L *41/04*

U.S. Cl. 346—140 R 14 Claims



1. A liquid jet apparatus comprising:

a liquid jet head having an electrical-mechanical transducing element for discharging liquid;

a drive circuit for driving said electrical-mechanical transducing element;

a directional coupling circuit including a dummy circuit whidh had a load corresponding to the load of said electrical-mechanical transducing element, a first connection circuit for connecting said transducing element with said drive circuit, a second connection circuit for connecting said dummy circuit with said drive circuit and a voltage generation circuit for generating a voltage corresponding to any voltage difference which may exist between the voltages across said transducing element and said dummy circuit; and

a detecting circuit for detecting via said voltage generation circuit the value of the voltage generated from said electrical-mechanical transducing element.

4,625,221

APPARATUS FOR EJECTING DROPLETS OF INK

Tsuneo Mizuno, Yokohama; Noboru Takada, Machida; Michio Shimura, Yokohama; Tohru Satoh, Yokohama, and Tadashi Matsuda, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

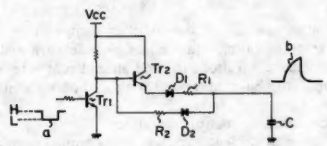
Continuation of Ser. No. 480,580, Mar. 30, 1983, abandoned.

This application Apr. 5, 1985, Ser. No. 720,483

Claims priority, application Japan, Mar. 31, 1982, 57-052963

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R 2 Claims



1. An apparatus for ejecting droplets of ink, comprising:

a passage for the ink;

an orifice disposed at one end of said passage;

pressure-applying means, communicating with the ink in said passage, for applying a pressure wave to the ink within said passage, comprising a piezoelectric crystal chip; and

signal-supplying means, operatively connected to said piezoelectric crystal chip, for supplying an actuating pulse signal to said piezoelectric crystal chip, said actuating pulse signal rising gradually and falling sharply and having a frequency which maximizes the displacement due to said pressure wave of the ink surface at said orifice, said signal-supplying means including—

power source means for supplying power;

a first transistor having an emitter operatively connected to ground and a collector operatively connected to said power source means;

a second transistor having a collector operatively connected to said power source means, a base operatively connected to the collector of said first transistor and an emitter;

a first diode operatively connected to the emitter of said second transistor;

a first resistance operatively connected to said first diode and said piezoelectric crystal chip;

a second diode operatively connected to said first resistance and said piezoelectric crystal chip; and

a second resistance operatively connected to said second diode and the base of said second transistor.

4,625,222

INTERACTING PRINT ENHANCEMENT TECHNIQUES

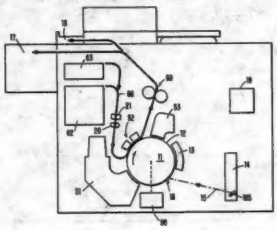
Larry W. Bassetti; Sherwood Kantor, both of Boulder, and Janis K. Richert, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1984, Ser. No. 611,561

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.[4] G01D *15/14, 9/42;* H04N *1/23*

U.S. Cl. 346—160 54 Claims



1. An electrophotographic printing machine comprising:

drive means;

movable carrier means driven by said drive means;

photoreceptive material mounted on said movable carrier means for cyclic movement through electrophotographic process stations;

charge corona means located at a first station for placing a relatively uniform electrostatic charge on the surface of said photoreceptive material;

exposure means located at a second station for selectively discharging the charged photoreceptive material to cause the formation of a latent image on said material;

toner for developing said image;

developer means located at a third station for applying said toner to said image to produce a developed image;

image receiving material;

transfer means located at a fourth station for transferring said developed image from said photoreceptive material to said image receiving material;

paper storage means for holding a supply of image receiving material;

a finishing station;

paper forwarding means for serially moving image receiving

material from said storage means through the transfer station to said finishing station;

control means for operating said exposure means, said control means comprising:

a character generator for producing data signals to drive said exposure means to produce the desired image on said photoreceptive material; and

enhancement means for altering certain of said data signals before presentation of said signals to said exposure means to produce smoothing of diagonal lines on said photoreceptor and broadening of fine lines in both horizontal and vertical directions on said photoreceptor whereby a print produced from an image generated in accordance with the altered signals is of an enhanced visual quality displaying easily discernible fine lines and smooth diagonal lines.

4,625,223

DOUBLE HETEROSTRUCTURE LIGHT-EMITTING SEMICONDUCTOR DEVICE

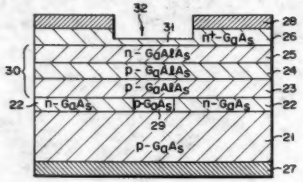
Tadashi Komatsubara, Tokyo, and Tetsuo Sadamasa, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 14, 1985, Ser. No. 701,513

Claims priority, application Japan, May 29, 1984, 59-108793

Int. Cl.[4] H01L *33/00*

U.S. Cl. 357—17 **3 Claims**



1. A double heterostructure light-emitting semiconductor device comprising:

a semiconductor substrate selected from a first conductivity type GaAs substrate and a first conductivity type GaAlAs substrate;

a first electrode provided on one surface of said semiconductor substrate;

a current confining layer formed on the other surface of said semiconductor substrate;

a confined current conduction layer formed in a selected region of said current confining layer;

a light-emitting semiconductor layer structure having a double heterojunction and formed on said current confining layer including said selected region; and

a capping layer formed of a second conductivity type GaAs layer on the free surface of said light-emitting semiconductor layer structure;

wherein said capping layer has a carrier concentration of $1\times10^{18}/cm^3$ or higher and includes first and second portions, said first portion being used as a light exit window layer and the thickness thereof being in a range of 0.2 to 2.0 microns and said second portion having a second electrode provided thereon.

4,625,224

THIN FILM TRANSISTOR HAVING POLYCRYSTALLINE SILICON LAYER WITH 0.01 TO 5 ATOMIC % CHLORINE

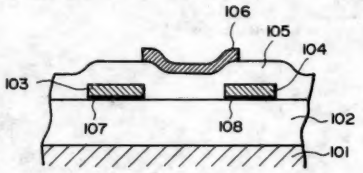
Katsumi Nakagawa, Tokyo; Toshiyuki Komatsu, Yokohama; Yoshiyuki Osada, Yokosuka; Satoshi Omata, Tokyo; Yutaka Hirai, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1983, Ser. No. 456,717

Claims priority, application Japan, Jan. 19, 1982, 57-7162

Int. Cl.[4] H01L *29/78, 27/12, 49/02, 29/04*

U.S. Cl. 357—23.7 **3 Claims**



1. A semiconductor element which comprises as a main part a polycrystalline silicon semiconductor layer containing 0.01 to 5 atomic % of chlorine atoms, said semiconductor layer having an X-ray diffraction pattern or an electron beam diffraction pattern of which the diffraction intensity at the (220) plane is 30% or more based on the total diffraction intensity.

4,625,225

INTEGRATED LIGHT DETECTION OR GENERATION MEANS AND AMPLIFYING MEANS

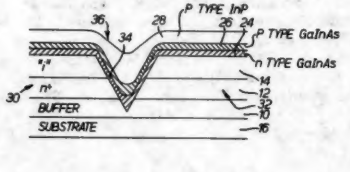
Robert C. Goodfellow, Brackley, and Andrew C. Carter, Greens Norton, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Jun. 11, 1982, Ser. No. 387,348

Claims priority, application United Kingdom, Jun. 13, 1981, 8118258

Int. Cl.[4] H01L *27/14, 31/10*

U.S. Cl. 357—30 **6 Claims**



1. An integrated circuit device comprising: a common substrate of semi-insulating material; a field effect transistor and a photo semiconductor diode formed on said substrate, said field effect transistor being integrated with said photo semiconductor diode;

said field effect transistor including:

a first layer of dopant enriched semiconductor material of first conductivity type overlayed upon said substrate, said first layer being divided into a source region and a drain region by a groove which extends at least the full depth of said first layer, the source and drain regions being adjacent respective walls of said groove; and

an infill structure including a second layer of first conductivity type, a third layer of second conductivity type, a first portion of said second layer lying inside said groove adjacent said walls of said groove and providing a conductive channel connecting said source and drain regions, a first portion of said third layer being spaced from said walls of

said groove, lying adjacent said first portion of said second layer, said third layer providing a gate for controlling the flow of carriers through said channel between said source region and said drain region;

said photo semiconductor diode including:

a plurality of layers of semiconductor material including a second portion of said second layer lying below a second portion of said third layer, said second portions of said second and third layers being co-deposited with said first portions thereof onto the substrate.

4,625,226

PHOTODETECTOR

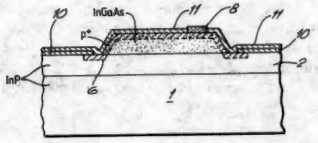
George R. Antell, Saffron Walden, England, assignor to Standard Telephones and Cables Public Limited Company, London, England

Filed Aug. 17, 1984, Ser. No. 641,694

Claims priority, application United Kingdom, Aug. 18, 1983, 8322235

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **16 Claims**



1. In a photodetector;

an $In_{(1-x)}Ga_xAs_yP_{(1-y)}$ body;

an active region provided in the vicinity of a p—n junction in the body; and

the junction extending in a first zone of material for which $0.9 \leqq y \leqq 1$, and the junction emerging at a surface of the body in a second zone which is of higher band gap than that of the first zone and upon which the first zone is directly or indirectly epitaxially grown.

4,625,227

RESIN MOLDED TYPE SEMICONDUCTOR DEVICE HAVING A CONDUCTOR FILM

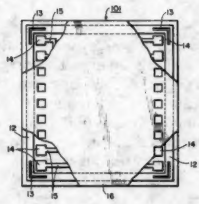
Yuji Hara, Koganei; Satoru Ito, and Tatsuro Toya, both of Tokyo, all of Japan, assignors to Hitachi, Ltd and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 292,585, Aug. 13, 1981, abandoned. This application Jun. 13, 1985, Ser. No. 744,151

Claims priority, application Japan, Sep. 1, 1980, 55-119817

Int. Cl.[4] H01L *23/48, 27/02, 29/34, 29/40*

U.S. Cl. 357—68 **33 Claims**



1. A semiconductor integrated circuit device having element regions which are formed in one major surface of a substantially tetragonal semiconductor substrate, a broad conductor film which provides a power source wiring and which is formed on an insulating film on the major surface of the semiconductor substrate and arranged to extend along a peripheral part of the major surface and on at least one corner of said semiconductor substrate, an inorganic passivation film which is formed over said conductor film, and a sealing member of a resin which overlies said passivation film and molds the semiconductor substrate; said broad conductor film having at least one opening therein for substantially limiting the effective width at a portion of the conductor film located on said at least one corner of said semiconductor substrate and for reducing stresses caused by the sealing member overlying the conductor film at said at least one corner thereby eliminating the occurrence of cracks in said passivation film; said at least one opening having a width that is substantially smaller than the width of said broad conductor film provided by portions of the broad conductor film adjacent to said at least one opening and the width of said broad conductor film being sufficient to act as a power wiring for said element regions.

4,625,228

MULTI-LAYER ELECTRICAL SUPPORT SUBSTRATE

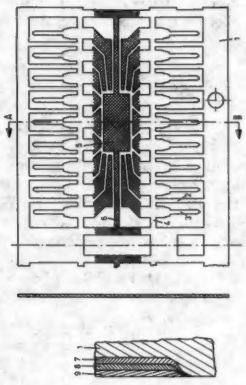
Albrecht Bischoff, Bruchköbel-Oberissigheim; Holger Eisentraut, Langenselbold, and Joachim Schmidt, Usingen, all of Fed. Rep. of Germany, assignors to W.C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 17, 1984, Ser. No. 661,934

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343251

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—70 **14 Claims**



1. A multi-layer support substrate for an electrical component, particularly for semiconductor elements or chips, said substrate having, at least in the region of support for said component,

a base portion made of copper or copper alloy, and a plating layer pattern of aluminum or aluminum alloy, applied to the base portion by roll-on plating, said plating layer pattern supporting said electrical component,

and comprising, in accordance with the invention,

a layer of nickel having less than 0.05% impurities, or contaminants, located between the base portion and the rolled-on plating layer.

4,625,229

ARRANGEMENT FOR PERMITTING RAPID COOLING OF AN ELECTRONIC COMPONENT OPERABLE AT LOW TEMPERATURES

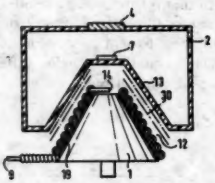
Horst Maier, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,315

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337195

Int. Cl.[4] F25B *19/00;* **H01L** *25/04*

U.S. Cl. 357—81 **9 Claims**



1. Arrangement for an electronic component which is operable at low temperatures and comprises a housing for the component and a cooler having a nozzle opening, the cooler being in communication with the housing so that a gas chamber exists around the cooler, the cooler operating in accordance with the Joule-Thomson effect in that gas under pressure flows through the cooler, and exits from the nozzle opening while expanding, and the resulting expanded gas flows through the gas chamber in thermal contact with gas under pressure flowing through the cooler, wherein there is arranged between the cooler **(1)** and the adjacent housing wall **(13)** a superinsulation foil body **(30)** which is structurally independent of the housing and which is constructed to have, between the cooler and the adjacent housing wall, a low thermal conductivity and capacity and a high thermal-transfer resistance, for thermally insulating the gs chamber for the expanded gas from the housing **(2)**.

4,625,230

COLOR TELEVISION TRANSMISSION OR DATA STORAGE SYSTEM WITH TIME DIVISION MULTIPLEX ENCODING AND DATA GENERATOR AND RECEIVER SUITABLE THEREFOR

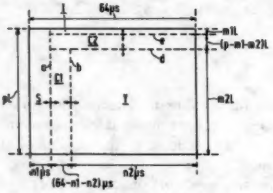
Sing L. Tan; Leendert J. van de Polder; Gerard De Haan, and Franciscus W. P. Vreeswijk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1984, Ser. No. 605,967

Claims priority, application Netherlands, May 6, 1983, 8301600; Mar. 23, 1984, 8400926

Int. Cl.[4] H04N *11/20, 11/06*

U.S. Cl. 358—11 **11 Claims**



1. A data receiver for use in a color television transmission system, said transmission system using time-division-multiplex encoding and comprising at least one data generator, at least one of said data receivers, and a transmission channel arranged between said data generator and said data receiver, said data generator comprising at least one signal source for producing signals containing luminance, chrominance, sychronizing and identification information, and an encoding circuit for the time-division-multiplex encoding of at least a portion of said signals selectively subjected to time compression, said encoding circuit having an output for supplying a time-division-multiplex encoded signal for transmission over said transmission channel, said data receiver comprising a decoding circit coupled to said transmission channel having a substantially complementary operation to that of said encoding circuit for supplying signals containing at least luminance and chrominance information which substantially corresponds to the signals produced by said signal source in said data generator, wherein in said data receiver, the decoding circuit comprises a line-frequency presettable counter for counting portions of television lines, outputs of said counter being coupled to address inputs of a programmable memory, a multiplexer, switchable by said received identification information, coupled to outputs of said programmable memory, a logic circuit coupled to output of said multiplexer for generating start, stop and selection signals, write signals at a write rate, and a plurality of read signals at a respective plurality of read rates, buffer memories for storing said luminance and chrominance information under control of said write signals and for supplying said luminance and chrominance information under control of a respective one of said plurality of read signals, and a clock pulse source for controlling said buffer memories, said clock pulse source being switchable by said logic circuit and said received identification information.

4,625,231

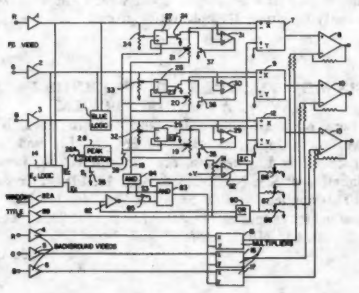
COMPREHENSIVE ELECTRONIC COMPOSITING SYSTEM

Petro Vlahos, Redway, Calif., assignor to Ultimatte Corporation, Reseda, Calif.

Filed Apr. 27, 1984, Ser. No. 604,637

Int. Cl.[4] H04N *9/74*

U.S. Cl. 358—22 **33 Claims**



30. The method of compositing color image background and foreground video signals involving a foreground scene a including subject before a red, blue or green colored backing and a background scene and automatically and simultaneously reducing the color components of the colored backing substantially to zero over its entire surface when said color components are of a different ratio in various areas of the colored backing, comprising the steps of:

(a) forming a control signal as a function of the brightness and visibility of the colored backing;

(b) comparing and automatically adjusting the level of the control signal to independently match the video level of each color component of the color backing in all areas of the backing;

(c) removing each color component of the backing by sub-

traction of the automatically adjusted control signal from the foreground scene video signal; and

(d) combining the foreground scene video signal, the color components of all areas of the backing having been removed therefrom, with the background scene video signal, the level of which has been controlled by the control signal, to form a composite image video signal.

4,625,232

DEMODULATION CIRCUIT FOR A DIGITIZED CHROMINANCE SIGNAL HAVING A SAMPLING SIGNAL OSCILLATOR COUPLED TO A CHROMINANCE SIGNAL OSCILLATOR

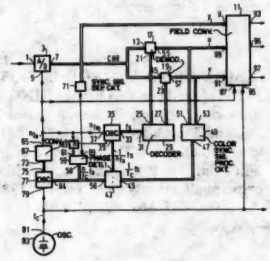
Antonius H. H. J. Nillesen, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,768

Claims priority, application Netherlands, Dec. 22, 1982, 8204936

Int. Cl.[4] H04N 9/66

U.S. Cl. 358—23 **2 Claims**



1. A demodulation circuit for a digitized chrominance signal of a color television signal sampled by means of a sampling signal at a sampling frequency, which circuit comprises a first digital oscillator for obtaining from the sampling signal a digitized reference signal of the subcarrier frequency of the chrominance signal, occurring at the sampling frequency, for demodulating this chrominance signal, for which purpose a phase control signal input of the digital oscillator is coupled to an output of a color synchronization signal phase detection circuit, characterized in that the sampling signal is obtained, by means of a second digital oscillator, from a signal source of a constant frequency, phase control signal input for a digital number of this second digital oscillator being coupled to an output of a phase detection circuit, as a result of which the frequency and phase ratio between the sampling signal and a signal of the horizontal deflection frequency is kept constant, which input for the digital number is further coupled to an input of a divide circuit for dividing a digital number, obtained from an output of the color synchronization signal phase detection circuit, by the digital number, an output of this divide circuit being coupled to the phase control signal input of the first digital oscillator.

4,625,233

I-PHASE FLESHTONE CORRECTION SYSTEM USING R-Y, G-Y AND B-Y COLOR DIFFERENCE SIGNAL DEMODULATORS

Leopold A. Harwood, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 26, 1985, Ser. No. 748,756

Int. Cl.[4] H04N 9/64

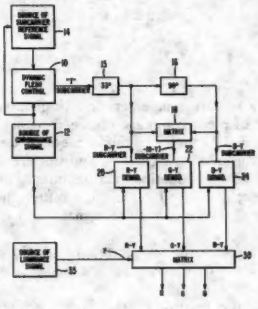
U.S. Cl. 358—28 **5 Claims**

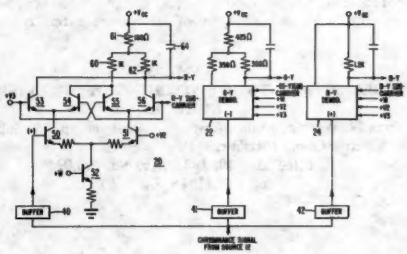
1. In a system for processing a video signal having a chrominance component containing color modulation information and a subcarrier burst reference component, apparatus for fleshtone correction and for demodulating said chrominance component comprising

means responsive to said burst component for developing a subcarrier having a phase along an I-phase demodulation axis, about which axis are chrominance signal components containing fleshtone information; and

automatic fleshtone control means, responsive to said I-phase subcarrier signal and to said chrominance component, for providing an output phase controlled flesh tone corrected I-phase subcarrier signal having a phase related to image fleshtone phase when the phase of said chrominance component is within a range of phases corresponding to a nominal range of fleshtone phase;

wherein to maintain the quality of chrominance components containing fleshtone information by reducing the likelihood of introducing AC amplitude errors and DC offset errors of the type subject to being produced by an I-phase demodulator system with an associated matrix circuit, the improvement comprising:





means for translating said phase controlled fleshtone corrected I-phase subcarrier output signal from said control means to produce plural subcarrier signals with phases respectively related to R-Y, G-Y and B-Y color difference signal phases; and

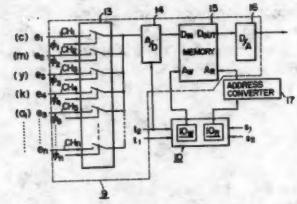
plural signal demodulators each having a signal input for receiving said chrominance component to be demodulated, and a control input for receiving respective ones of said R-Y, G-Y and B-Y phase subcarrier signals for directly producing output demodulated R-Y, G-Y and B-Y color image difference signals.

4,625,234

METHOD OF USING A BUFFER MEMORY DEVICE FOR STORING A PLURALITY OF PICTURE SIGNALS

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Sep. 14, 1983, Ser. No. 532,106
Claims priority, application Japan, Oct. 5, 1982, 57-174976
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—78 12 Claims



1. In a picture image reproduction device which stores a plurality of picture signals, obtained by scanning a multi-colored original picture, in a buffer memory device and reads out each of the picture signals in appropriate timing to record a plurality of reproduction picture images substantially at the same time, a method of using a buffer memory device for storing a plurality of picture signals, said method comprising the steps of:

scanning an original picture to obtain a train of picture signals of n different types, n being an integer greater than one;

storing the picture signals in sequential addresses of the buffer memory device in the order they are obtained;

reading the stored data out of the buffer memory device at a predetermined address interval so as to separate the picture signals of each type and thereby read picture signals of the same type out of said buffer memory device in sequential order; and

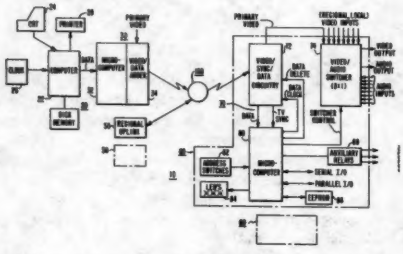
recording a reproduction picture image of each type according to the picture signal of the corresponding type.

4,625,235

REMOTE CONTROL SWITCHING OF TELEVISION SOURCES

John N. Watson, Moorestown, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 496,023
Int. Cl.[4] H04N *7/10, 7/08*
U.S. Cl. 358—86 20 Claims



2. In a communication system for making available both satellite and non-satellite video programs to one or more local television systems wherein said satellite video programs include at least a primary video program having primary video signals having data inserted in a non-video portion of the primary video signals, said data including address and command information, the combination of

at least one local television system including:

a video decoder means for accepting said primary video signals and separating said data from the primary video signals and providing said data and said primary video signals without the data as separate output signals,

a source of one or more non-satellite video programs,

a video switching means having a plurality of video program inputs and a video program output, satellite video programs, including said primary video output signals of said video decoder means and said non-satellite video programs being video program inputs to said video switching means, and

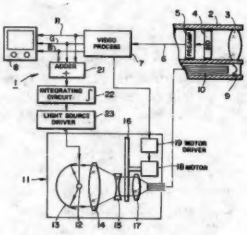
a computer means having a specific address identification and responding to data output signals from the video decoder means which have the same address by transmitting control signals consistent with said command information to said video switching means to develop a local television system program comprised of one or more of said satellite and non-satellite programs as determined by said command information.

4,625,236

LIGHT SOURCE MEANS FOR ENDOSCOPE EMPLOYING SOLID STATE IMAGING DEVICE

Hiroyoshi Fujimori, Hachioji; Tatsuo Nagasaki, Musashino; Tadashi Kato, and Masahiko Sasaki, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 755,763
Claims priority, application Japan, Jul. 31, 1984, 59-162522
Int. Cl.[4] A61B *1/04, 1/06*
U.S. Cl. 358—98 5 Claims



1. An endoscope comprising:

an inserting member;

a focusing objective lens positioned at a leading end of said inserting member, said objective lens receiving light from a subject to be examined;

a solid state imaging device disposed in said inserting member such that an image plane of said imaging device is positioned at the focal plane of said objective lens;

a video process means receiving an output from said solid state imaging device for recording in a memory electrical signals from said imaging device corresponding to an image focussed on the image plane of said imaging device and outputting color signals therefrom;

display means connected to said video process means for displaying said color signals;

a light guide disposed within said inserting members for transmitting light therethrough, said light guide having an input end and an output end thereof, said output end positioned proximal to said objective lens for illuminating said subject;

a light source means for projecting light onto the input end of said light guide, said light source means providing sequential color illumination of three different colors to said light guide, including,

an illuminating source lamp,

a reflector, reflecting light from said source lamp in a parallel beam,

a convex lens system disposed in said parallel light path for converging said parallel light, to project said converging light onto said input end of said light guide,

a first lens system and a second lens system disposed in the optical path between said convex lens system and the input end of said light guide, said first lens system being positioned between said second lens system and said convex lens system, such that the cross sectional area of the light beam between said first and second lens systems is less than the cross sectional area of the parallel light beam between said reflector and said convex lens system, and such that said light beam between said first and second lens systems has a smaller angle with respect to the optical axis of said lens systems than the light between said convex lens system and said first lens system,

a rotary intereference color filter rotatably disposed in the light path between said first and second lens systems, said interference color filter having three different color filters therein such that each of the different color filters are sequentially positioned in the light path during rotation for passing light having specific wavelengths therethrough, and

driving means for rotating said rotary intereference color filter to sequentially illuminate the input end of the light guide, and in turn the subject with three colors of illuminating light.

4,625,237

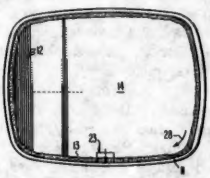
METHOD FOR DETECTING BLEMISHES CONTIGUOUS TO THE PERIMETER OF A CCD IMAGE

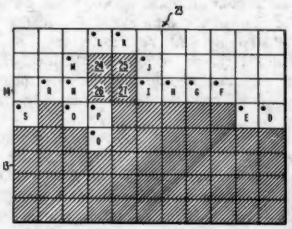
Edward Cohen, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 22, 1984, Ser. No. 663,153

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—106 **6 Claims**





1. A method of detecting blemishes contiguous to the perimeter of an image on the pixels of a charge coupled device (CCD) comprising the steps of:

sequentially detecting the charge levels on the pixels around said perimeter, said detecting occurring in a selected direction and consisting of a plurality of motions, wherein a motion is the detection of the charge levels on at least three consecutive pixels, and wherein straight motions and motions occurring in said selected direction are permissible, while motions in a direction opposite to said selected direction are blemish motions; and

providing a blemish signal when two blemish motions occur and a motion in said selected direction has not occurred between said blemish motions.

4,625,238

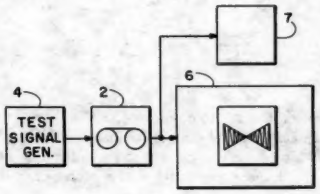
METHOD AND APPARATUS FOR DETECTING A DEAD ZONE IN THE TRANSFER FUNCTION OF A SIGNAL PROCESSING SYSTEM

Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 12, 1985, Ser. No. 722,944

Int. Cl.[4] H04N *17/00, 17/06;* H04B *17/00*

U.S. Cl. 358—139 **5 Claims**



1. A method of detecting a dead zone in the transfer function of a signal processing system, comprising impressing on the system a test signal formed within a predetermined interval from a sinusoidal waveform modulated by an envelope function of which the absolute value reduces to zero at a predetermined time within said interval, and determining whether the corresponding output signal provided by the signal processing system has constant amplitude at times within said interval other than said predetermined time.

4,625,239

TELEVISION CIRCUIT FOR PICTURE FLICKER CORRECTION

Franciscus W. P. Vreeswijk; Sing L. Tan, and Leendert J. Van De Polder, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 27, 1984, Ser. No. 675,119

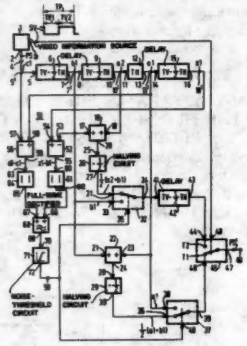
Claims priority, application Netherlands, Dec. 5, 1983, 8304165

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—140 **8 Claims**

1. A television circuit for picture flicker correction, provided with a first and a second delay device coupled to an input terminal of the television circuit, said delay devices each having a delay time substantially corresponding to a field period, inputs of a first and a second adding circuit being respectively connected in parallel with the first and the second delay devices, outputs of the first and second adding circuits being coupled to respective inputs of a first switch-over device which has a switching input for receiving a switching signal controlling the switching of the first switch-over device at the occurrence of each field period, an output of the first switch-over device being coupled the an output terminal of the television circuit, characterized in that the television circuit additionally comprises a movement detector, second and third switch-over devices having first inputs and outputs coupled, respectively, between the outputs of the first and second adding circuits and the respective inputs of the first switch-over device, switching inputs of the second and the third switch-over devices being respectively coupled to an output of the movement detector, the second and third switch-over devices each having a second input connected to a respective point of

the first and second delay devices, which second inputs, in the absence of movement detection, are connected to the respective outputs of the second and third switch-over devices, to which respective outputs, in the presence of movement detec-



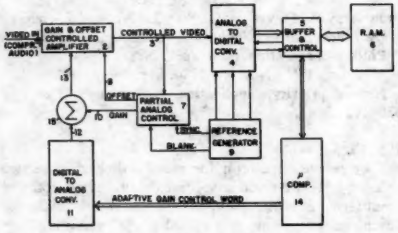
tion, the first inputs are connected, and a third delay device, having a delay time substantially equal to a field period, being coupled between the output of the second switch-over device and the respective input of the first switch-over device.

4,625,240

ADAPTIVE AUTOMATIC GAIN CONTROL

Robert E. Yablonski, Irvine, and John A. Roe, Orange, both of Calif., assignors to Eeco, Inc., Santa Ana, Calif.

Filed Jul. 25, 1984, Ser. No. 634,394
Int. Cl.[4] H04N *7/04, 5/52*
U.S. Cl. 358—143 **3 Claims**



1. The process of controlling a television compressed audio signal that comprises the processing steps of;

(a) applying said compressed audio signal to a gain and offset controlled amplifier,

(b) applying the output of said gain and offset controlled amplifier to an analog to digital converter,

(c) storing the thus converted signal in digital form,

(d) determining the average value of the stored signal,

(e) generating a control word according to the average value of the stored signal,

(f) applying the control word to a digital to analog converter, and

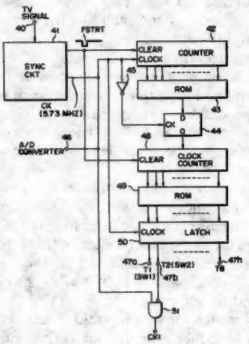
(g) applying the output of said digital to analog converter to said controlled amplifier to contol the gain thereof.

4,625,241

TIMING CONTROL SIGNAL GENERATOR FOR TELETEXT SIGNAL WAVEFORM EQUALIZER

Kazuo Ohzeki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 14, 1985, Ser. No. 701,515
Claims priority, application Japan, Feb. 16, 1984, 59-25974
Int. Cl.[4] H04N *7/087*
U.S. Cl. 358—147 **3 Claims**



1. A timing circuit used in a Teletext signal waveform equalizer to remove waveform distortions of a Teletext signal inserted into a horizontal scanning line during a vertical blanking interval of a television signal and arranged to generate timing control signals for controlling the operation of said waveform equalizer, timings when the level of each of said timing control signals varies running from the start of the vertical blanking interval being predetermined, comprising:

synchronous circuit means connected to receive the television signal for generating a field start signal corresponding to the start of the vertical blanking interval and sample clock pulses having a frequency equal to a sample clock rate of the Teletext signal and phase-locked with samples of the Teletext signal;

first counter means connected to said synchronous circuit means for counting the sample clock pulses, said first counter means being cleared by the field start signal;

first read only memory means having address inputs coupled to outputs of said first counter means and having stored information as to each level changing point of said timing control signals, said read only memory means being accessed by said first counter means to read out the level changing point information from an address designated by said first counter means at a point of time when the level of at least one of said timing control signals changes after the field start signal has been generated;

second counter means for counting the level change information read out from said first read only memory means, said second counter means being cleared by the field start signal;

second read only memory means having address inputs coupled to outputs of said second counter means and having stored information as to levels of said timing control signals at each of the level change points of said timing control signals in an address corresponding to the level change point, said second read only memory means being accessed by said second counter means to read out, at a timing when at least one of the timing control signals changes, the level information of the timing control signals at said timing; and

circuit means responsive to the sample clock pulses for holding the level information of the timing control signals read out from said second read only memory means until

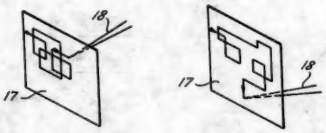
different level information is read out therefrom, thereby producing the timing control signals.

4,625,242

METHOD OF AND SYSTEM FOR REPRESENTING INFORMATION DATA

Iosif Baumberg, 54 Bay 29 St., Brooklyn, N.Y. 11232

Filed Apr. 24, 1985, Ser. No. 726,665
Int. Cl.[4] H04N 5/30
U.S. Cl. 358—209 **16 Claims**



1. A method of representing information data, comprising the steps of

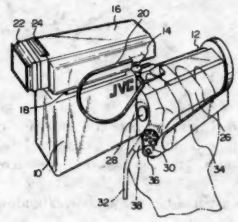
scanning information data, including interrogating information data by a movable interrogating element, forming a flow of impulses corresponding to the data which have been interrogated by said interrogating element, and moving said interrogating element successively in directions selected in response to commands formed in response to said impulses, from more than two directions with an equal probability.

4,625,243

HAND-HELD TV CAMERA

Takayuki Takubo, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed May 19, 1983, Ser. No. 496,022
Claims priority, application Japan, May 25, 1982, 57-76598[U]
Int. Cl.[4] H04N 5/30
U.S. Cl. 358—229 **5 Claims**



1. A camera comprising, in combination:

a camera body;

a lens system located in front of said camera body and accommodated in a lens casing, said lens system having an optical axis;

grip means mounted on a side of said lens casing and extending parallel to said optical axis, said grip means having a rear end portion disposed in front of and laterally to one side of said camera body;

connecting means for connecting to the camera a cable which connects the camera to a recording apparatus, said connecting means being positioned at said rear end portion of the grip means which is adjacent to the center of gravity of the whole camera; and

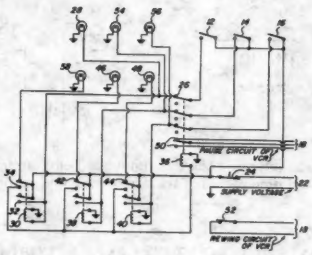
a button for remotely controlling the start and stop of the operation of the recording apparatus, said button being positioned at said rear end portion of the grip means which is adjacent to the camera body.

4,625,244

MULTIPLE REMOTE CONTROL VCR PAUSE SWITCH

Lawrence Chong, 506 12th St., Brooklyn, N.Y. 11215, and Ha Tom, 71-11 31st Ave., Jackson Heights, N.Y. 11370

Filed Sep. 25, 1985, Ser. No. 779,834
Int. Cl.[4] H04N 5/76, 5/782; G09B 7/06
U.S. Cl. 358—335 **3 Claims**



1. Multiple remote control VCR pause switch, comprising in combination:

(a) N momentary contact response switches, each mounted in an individual cabinet, connected to a switching console, wherein said switching console controls the pause and the rewind functions of an accessory video cassette recorder such that when any of said momentary contact response switches is activated said video cassette recorder pauses;

(b) N valid first response lamps, one for each said response switch, such that when the first of said response switches is depressed its respective said valid first response lamp is illuminated; however, any subsequent activation of any of remaining said response switches does not result in the illumination of any remaining said valid first response lamps;

(c) N invalid response lamps, one for each said response switch, such that said invalid response lamps are all normally illuminated until the said first activation of said response switch wherein said respective invalid response lamp is extinguished and all remaining said invalid response lamps remain illuminated;

(d) a momentary contact reset switch which, when activated, causes said accessory video cassette recorder to resume its normal playback feature and also causes all said invalid response lamps to return to their normally illuminated condition; and,

(e) a rewind-search switch which remotely activates the rewind-search function of said accessory video cassette recorder.

4,625,245

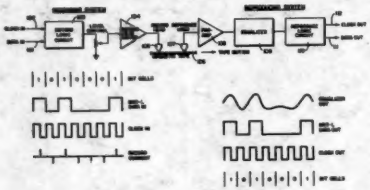
MAGNETIC RECORDING

R. Kent White, 420 Kisconko Turn, Ft. Washington, Md. 20744

Continuation-in-part of Ser. No. 560,103, Dec. 12, 1983, abandoned. This application Nov. 8, 1984, Ser. No. 669,357
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—40 **17 Claims**

1. A method of magnetic recording by means of a magnetic recording head having a recording gap and a magnetic recording medium having a recording surface, wherein a relative traverse is effected between said head and said medium across said gap, said head providing a determined length of effective recording field along the line of said traverse approximating the length of said gap, comprising applying to said recording head a sequence of electrical impulses of short time duration and at spaced time intervals for effecting magnetic recording thereof in said medium as recorded increments, the time dura-

tion of each of said impulses being a small fraction of the time period for said traverse across said gap, and the length of each



of said time intervals between impulses being approximately equal to said time period of traverse across said recording gap.

4,625,246

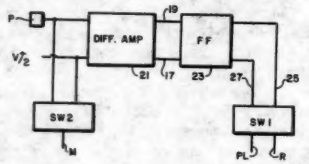
CONTROL CIRCUIT FOR TAPE RECORDERS

Lajos Burgyan, Palo Alto, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 27, 1984, Ser. No. 593,785

Int. Cl.[4] G11B *15/12*

U.S. Cl. 360—62 **4 Claims**



1. Circuit means for recorders in which the same external pin receives a play signal, a record signal and a noise reduction signal generated by a user comprising

(a) differentiating means receiving said play and record signals and differentiating between them;

(b) memory means connected to said differentiating means and storing an indication of the last received of said play and record signals;

(c) first switch means connected to said memory means and operable to a first condition to control the play function when the memory means indicates said play signal was the last received, and to a second conditon to control the record function when the memory means indicates said record signal was the last received; and

(d) second switch means connected to said external pin receiving said noise reduction signal and generating an output signal to turn on noise reduction means during either the play or the record function.

4,625,247

DISK DRIVE

Kengo Saito, Miyagi; Yasunori Ohtsu, Tokyo; Isao Akahira, and Makoto Inoue, both of Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

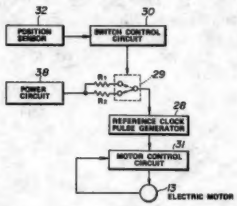
Filed Sep. 17, 1985, Ser. No. 776,852

Claims priority, application Japan, Sep. 22, 1984, 59-199269

Int. Cl.[4] G11B *5/012, 19/20*

U.S. Cl. 360—71 **4 Claims**

1. A disk drive comprising a turntable having concentrically and eccentrically located pins which are, upon setting the disk onto said turntable, inserted respectively into concentrically and eccentrically located holes in the disk, the eccentically located pin being, upon rotation of said turntable, brought into contact with the forward edge of the eccentrically located hole, thus achieving a drive connection between said turntable and said disk; biasing means for biasing said eccentrically located pin radially outward against the outer edge of the eccentrically located hole thus centering the disk on said turntable; an electric motor for driving said turntable upon energization thereof; and an electric circuit for energizing said electric motor so as to drive said turntable at a predetermined constant speed, said electric circuit being so constructed as to reduce the rotation speed of said electric motor and thus the speed of said turntable to a level considerably lower than the predetermined speed within a given short period of time after starting to rotate said turntable.



4,625,248

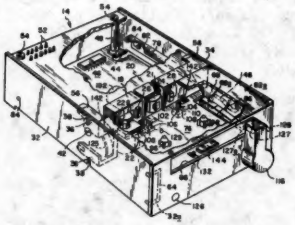
ULTRA-THIN TAPE CASSETTE TRANSPORT

George H. Manning, Nashua, and Pasquale R. Riccio, Salem, both of N.H., assignors to Memtec Corporation, Salem, N.H.

Filed May 16, 1983, Ser. No. 494,638

Int. Cl.[4] G11B *5/008, 15/00, 17/00, 21/08*

U.S. Cl. 360—96.5 **14 Claims**



1. A reel-to-reel tape cassette transport for operating on a multiple track tape contained in a cassette having a working edge with a window that exposes the tape therein, said transport comprising

A. a rigid transverse beam member extending along a first axis;

B. a magnetic head assembly rigidly mounted to the transverse member, said head assembly including a head movable relative to the base along a second axis perpendicular to said first axis;

C. A front wall mounted a fixed distance in front of the transverse member;

D. means defining a cassette receiving slot in the front wall;

E. cassette locating means integral with and projecting from the transverse member on each side of the head assembly toward said front wall while locating the cassette working edge opposite the head assembly along a locating axis parallel to said second axis;

F. means defining a loading plane and for guiding the cassette from the slot to the transverse member so that the working edge of the cassette seats against, and is located by said locating means;

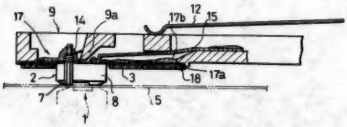
G. support means positioned between the transverse member and the front wall for supporting a cassette inserted into the receiving slot;

H. drive spindles projeting up from the support means;
I. upstanding cassette locating pins mounted to the support means between the transverse member and the spindles for locating the cassette along a third axis perpendicular to said first and second axes
J. means for hinging the support means relative to the transverse member so that the support means can swing between an operating position wherein the spindles and locating pins project up through said plane and a loading position wherein the spindles and pins are disposed below said plane, and
K. means for moving the support means between said operating and loading positions.

4,625,249
HEAD HOLDING MECHANISM OF MAGNETIC DISK DEVICE

Tetsuya Iwata, Yunotani, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 349,972, Feb. 18, 1982, abandoned. This application Nov. 29, 1985, Ser. No. 804,589
Claims priority, application Japan, Feb. 24, 1981, 56-25750
Int. Cl.[4] G11B *21/00, 21/16*
U.S. Cl. 360—104 **7 Claims**

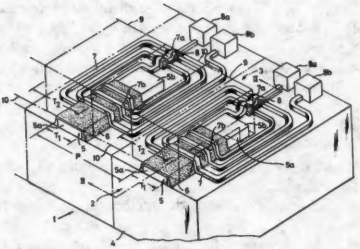


1. In a head holding mechanism for a magnetic disk device having at least one magnetic head adapted to engage a surface of a magnetic disk, a frame, a gimbal mounted on said frame, and said magnetic head mounted on said gimbal, the improvement comprising an uneven layer of a vibration absorbent material applied to at least one surface of said gimbal so as to provide a diffuse dampening characteristic over a wide range of vibration frequencies.

4,625,250
MULTI-TRACK MAGNETIC HEAD

Norio Shibata, Sagamihara, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Jan. 6, 1983, Ser. No. 456,324
Claims priority, application Japan, Jan. 7, 1982, 57-771[U]
Int. Cl.[4] G11B *5/16, 5/20*
U.S. Cl. 360—121 **8 Claims**

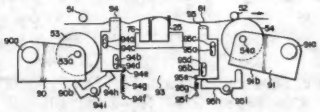


1. A multi-track magnetic head, having a plurality of heads arranged in line, each of said heads comprising:
(a) a substrate;
(b) a thin film core formed on one surface of said substrate and partially covering said surface, one end of said thin film core being located that said one end of said thin film core flush with one end of said substrate;
(c) an insulating film formed on said thin film core and partially covering said thin film core at said one end, one end of said insulating film being located flush with said one end of said thin film core;
(d) a U-shaped block core including front and rear ribs and a web interposed between said ribs, the front rib being secured to and flush with the flush end of said insulating film the rear rib being secured to said thin film core, and said intermediate web being spaced from said thin film core and insulating film layers by a predetermined distance; and
(e) a winding having a portion received in a space defined by the surface of said insulating film and said intermediate web of said block core.

4,625,251
TAPE RECORDER

Seiji Tomita, Yokosuka; Kaoru Morinaga, and Yoshihiro Kotoda, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 17, 1982, Ser. No. 419,603
Claims priority, application Japan, Nov. 25, 1981, 56-188894
Int. Cl.[4] G11B *15/60*
U.S. Cl. 360—130.21 **1 Claim**



1. A tape recorder comprising:
tape drive means for driving a magnetic tape at normal speed in one of forward and reverse directions;
forward/reverse switching means connected to said tape drive means for switching the driving of the magnetic tape at normal speed between said forward and reverse directions;
head means for performing at least one of recording and playback of the magnetic tape;
a pair of tape guide means each disposed adjacent to a respective side of said head means and supported so as to be movable between a first position in guiding contact with the tape to guide the tape and a second position spaced from the tape; and
tape guide drive means operatively interlocked to said forward/reverse switching means, said tape guide drive means for displacing to the first position one of said pair of tape guide means which is disposed on an upstream side of a tape travel direction with respect to the head means and for displacing to the second position the other of said pair of tape guide means which is disposed on a downstream side of the tape travel direction with respect to the head means, said tape guide drive means displacing said pair of tape guide means in response to the tape being driven in one of said forward and reverse directions upon operation of said forward/reverse switching means;
a pair of capstans each disposed adjacent to a respective side of said head means;
a pair of pinch rollers each supported for movement between contact and separation positions relative to a respective one of said capstans; and
pinch roller drive means for moving one of said pinch rollers into said contact position and thus in tight contact with one of said capstans and for moving the other of said pinch rollers into said separation position thus separating the other of said pinch rollers from the other of said capstans when the tape is driven at normal in one of said forward

and reverse directions by said forward/reverse switching means;

said tape guide drive means including means for interlockingly driving said tape guide drive means with said pinch roller drive means;

head rotating means for rotatably supporting said head means so as to register said head means with a track in accordance with one of the forward and reverse directions in which said tape is driven at normal speed; and

drive slider means being slidably moveable in a predetermined direction interlockingly with the switching operation of said forward/reverse switching means to drive said head rotating means and said pinch roller drive means; wherein said pinch roller drive means includes

a pair of pinched lever means each for rotatably supporting a respective one of said pinch rollers and each pivotal between an advance position to bring said one of said pair of pinch rollers into contact with said one of said pair of capstans and a retracted position to separate said one of said pair of pinch rollers from said one of said pair of capstans; and

urging means providing an urging force for urging said one of said pair of pinch rollers supported by a respective one of said pinch lever means to bring said one of said pinch rollers into contact with said one of said pair of said capstans, respectively, said urging means including means for preventing pivotal movement of said pinch lever means due to said urging force of said urging means, by selectively engaging said one of said pinch lever means with said drive slider means in accordance with a sliding position thereof.

4,625,252

GUIDE SYSTEM AND MAGNETIC TAPE CASSETTE COMPRISING SUCH A SYSTEM

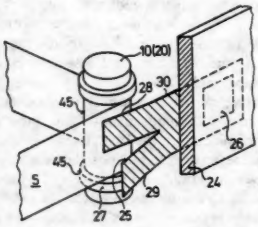
Werner Balz, Limburgerhof; Wulf Muenzner, Frankenthal; Klaus Dieter Schomann, Ludwigshafen; Heinz Berger, Kehl, and Roland Roos, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,606

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 8125650; Dec. 23, 1981, 8137551

Int. Cl.[4] G11B *15/60, 23/02*

U.S. Cl. 360—130.21 **8 Claims**



1. A magnetic tape cassette, particularly video tape cassette, having a substantially rectangular housing of plastic material and, in said housing, two tape reels and guide means, including two deflecting elements adjacent the respective front corner of said housing for guiding the tape from one of said reels via one of said deflecting elements, over a path parallel to the front of said housing, and via the other deflecting element onto the other reel, said tape having a magnetic layer (front) face and an electrically insulating plastics film (back) face, and said deflecting elements contacting the back face of the tape and being at least partially of electrically conductive material, and said housing also including adjacent at least one of said deflecting elements a flexible connector element having at least one electrically conductive surface and having a split free end, one of the free end portions of said connector element contacting the front face of the tape and the other free end portion contacting the surface of said deflecting element, so as to equalize electrostatic charges between the two faces of the tape by way of said free end portions and thus counteract sticking of said tape to said deflecting elements and counteract the build-up of electrostatic charges along the tape path parallel to the front of the housing.

4,625,253

MAGNETIC TAPE CASSETTE

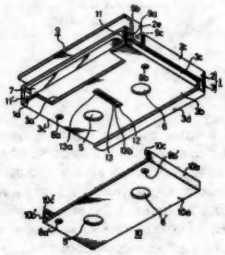
Kenji Kawakami, Kanagawa; Norikazu Horikawa, Tokyo, and Yoshinori Yamamoto, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 12, 1984, Ser. No. 649,725

Claims priority, application Japan, Sep. 19, 1983, 58-172668

Int. Cl.[4] G11B *23/08*

U.S. Cl. 360—132 **12 Claims**



1. A magnetic tape cassette, comprising:

a casing enclosing first and second reel hubs adapted to have a magnetic tape wound thereabout;

a first portion of said casing having first and second reel shaft insertion apertures for respectively receiving said first and second reel hubs and a marginal cut-out portion through which said magnetic tape may be withdrawn from said cassette; and

sliding plate means provided on said first portion and freely slideable between first and second positions thereon, so that, in said first position of said sliding plate means, said first and second insertion apertures and said cut-out portion are exposed for respectively receiving first and second reel shafts and tape withdrawing means and, in second position, said sliding plate means covers said first and second insertion apertures and said cut-out portion, whereby said magnetic tape in said cassette is protected from external contamination;

said casing including a front surface having a front opening therein;

said magnetic tape cassette further comprising front lid means;

said front lid means forming a freely pivoting connection adjacent to said front opening and being movable between a closed position covering said front opening and an open position exposing said front opening; and

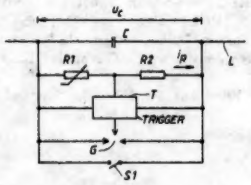
said sliding plate means in its second position engaging said front lid means in said closed position to maintain said front lid means in said closed position.

4,625,254

VOLTAGE TRIGGER MEANS FOR A SERIES CAPACITOR PROTECTOR

Nils Fahlén, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Jun. 15, 1984, Ser. No. 620,955
Claims priority, application Sweden, Jun. 17, 1983, 8303481
Int. Cl.[4] H02H 7/16
U.S. Cl. 361—16 10 Claims



1. A protective circuit for a series capacitor in a high-voltage network, said circuit comprising:

a voltage-dependent resistor built up of metal oxide varistors and a linear resistor connected in series therewith, said series-connected voltage-dependent resistor and linear resistor being connected in parallel with a series capacitor;

at least one spark gap in parallel with said series-connected voltage-dependent resistor and linear resistor to shunt the latter with overload voltage thereof;

a trigger device to trigger said spark gap and responsive to the voltage generated across said linear resistor when said voltage exceeds a predetermined voltage; and

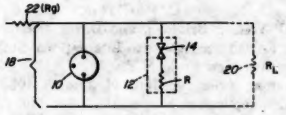
said predetermined voltage being less than half the total voltage across said series capacitor.

4,625,255

INTERACTIVE OVERVOLTAGE PROTECTION DEVICE

Jerzy Borkowicz, Ottawa; James E. Anderson, Almonte, and Frederick C. Livermore, Stittsville, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 23, 1984, Ser. No. 602,895
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—91 3 Claims



1. An overvoltage protection device comprising a primary protector and a secondary protector for connection directly in parallel across a transmission line,

said primary protector, when subjected to applied voltages, having firing voltages which increase with the rate of change of said applied voltages and

said secondary protector comprising a semiconductor device having:

a high impedance when subjected to applied voltages below a predetermined operating voltage;

a substantially negligible impedance when subjected to applied voltages above a predetermined failure voltage that exceeds said operating voltage; and

a dynamic impedance when subjected to applied voltages in a range between said operating voltage and said failure voltage,

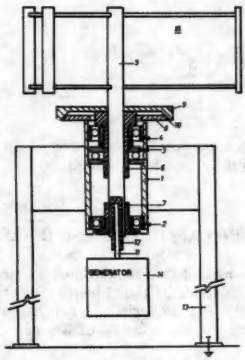
whereby, when said protection device is subjected to a voltage surge, said dynamic impedance will reduce the rate of change of voltage of that part of said voltage surge in said range, thereby increasing the probability of said primary protector firing at an applied voltage in said range.

4,625,256

OVERVOLTAGE PROTECTOR FOR A DEVICE HAVING TWO PARTS MOVABLE RELATIVELY TO EACH OTHER

Viktor Scuka, Trollbäcksvägen, and John Akerlund, Vasavägen, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE83/00349, § 371 Date May 18, 1984, § 102(e) Date May 18, 1984, PCT Pub. No. WO84/01673, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 10, 1983, Ser. No. 616,213
Claims priority, application Sweden, Oct. 15, 1982, 8205876
Int. Cl.[4] H02H 3/22
U.S. Cl. 361—117 5 Claims



1. Overvoltage protected apparatus comprising a first stationary member at ground potential, a second movable member subject to electrical voltage, bearing means between said members to provide relative movement therebetween, and overvoltage protection means for opposing current flow through said bearing means between said members, said overvoltage protection means comprising electrical insulative means between said bearing means and said second member to prevent current flow between said members due to voltage difference between said members thereby to protect said bearing means from damage due to current flow therethrough, and means on said members providing a spark gap therebetween which remains substantially constant during relative movement of said members, the combination of said electrical insulation means and said spark gap preventing current flow through the bearing means due to voltage difference between said members resulting from movement of the second movable member and the grounded stationary member as well as due to application of external voltage to said movable member.

4,625,257

ANTI-STATIC CHAIR

David Lissner, 5250 Briggs Ave., La Crescenta, Calif. 91214

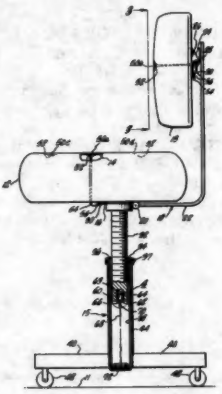
Continuation-in-part of Ser. No. 672,617, Nov. 19, 1984, abandoned. This application Feb. 22, 1985, Ser. No. 704,162
Int. Cl.[4] H05F 3/02
U.S. Cl. 361—212 20 Claims

1. A chair for discharging a static electrical charge carried by an occupant of the chair, the chair comprising:

(a) a seat comprising an electrode for discharging a static electrical charge carried by the occupant;

(b) means for connecting the electrode to a source of ground potential; and

(c) means for preventing the discharge until the charge exceeds a predetermined level, the means for preventing



comprising a breakdown device connected between electrode and the means for grounding.

4,625,258

CERAMIC CAPACITORS AND DIELECTRIC COMPOSITIONS

Dawn A. Jackson, Old Harlow, England, assignor to Standard Telephones and Cables, Public Limited Co., London, England

Filed Feb. 28, 1985, Ser. No. 706,790

Claims priority, application United Kingdom, Mar. 3, 1984, 8405650

Int. Cl.[4] H01G *4/10*; C04B *33/34, 35/46*

U.S. Cl. 361—321 **15 Claims**

1. A dielectric composition comprising non-stoichiometric lead magnesium niobate, non-stoichiometric lead zinc niobate and non-stoichiometric lead iron niobate.

4,625,259

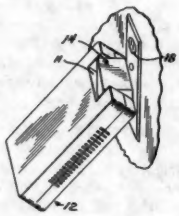
INTEGRAL PIVOTING POWER SUPPLY

Kenneth R. Krechmer; James C. Milroy; William R. Burnett, and Thomas A. Howell, all of Palo Alto, Calif., assignors to Prentice Corporation, Sunnyvale, Calif.

Filed Apr. 12, 1984, Ser. No. 599,570

Int. Cl.[4] H02B *1/04*

U.S. Cl. 361—340 **8 Claims**



1. A housing assembly, comprising

a power supply;

a first housing holding said power supply;

pivot means affixed to said first housing for pivoting with said first housing;

an electronics unit powered by said power supply;

a second housing holding said electronics unit, said second housing having a cavity configured to permit said first housing to pivot within said cavity in said second housing; and

electrical connector means for providing an electrical connection between said power supply and said electronics unit while said first housing is pivoted within said cavity in said second housing.

4,625,260

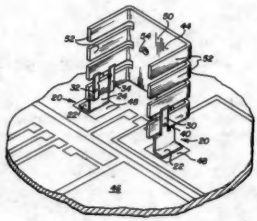
FASTENERS FOR SURFACE MOUNTING OF PRINTED CIRCUIT BOARD COMPONENTS

William D. Jordan, Dallas, and Donald L. Clemens, The Colony, both of Tex., assignors to Thermalloy Incorporated, Dallas, Tex.

Filed Aug. 24, 1984, Ser. No. 644,038

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—386 **32 Claims**



28. A fastener for mounting a heat sink to the surface of a circuit board comprising:

a body;

first means extending from said body for detachably engaging the heat sink;

second means extending from said body opposite said first means for contacting the surface of the circuit board; and

said second means including a surface parallel to the surface of the circuit board when said body is mounted thereon, said surface being adapted for bonding to the surface of the circuit board.

4,625,261

CAPACITORS

Ronald D. Weeks, Brixham, and David J. Croney, Paignton, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

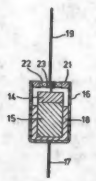
Continuation of Ser. No. 160,524, Jun. 18, 1980, abandoned. This application May 9, 1983, Ser. No. 493,130

Claims priority, application United Kingdom, Jul. 3, 1979, 7923112

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.[4] H01G *9/00*; H01L *23/02*

U.S. Cl. 361—433 **3 Claims**



1. An electrical component comprising, in contact and electrical connection with one another, a tin-containing solder alloy body and a conductive coating layer having both silver

particles and uncoated copper particles in intimate mixture throughout the layer.

4,625,262

POINTER ILLUMINATING STRUCTURE IN MEASURING INSTRUMENT

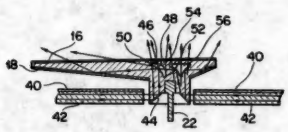
Yutaka Sakakibara; Hidetaka Ueda, and Kunio Majima, all of Shimada, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 6, 1984, Ser. No. 628,278

Claims priority, application Japan, Jul. 8, 1983, 58-105444[U]; Aug. 19, 1983, 58-127221[U]; Aug. 19, 1983, 58-127222[U]

Int. Cl.[4] G01D *11/28*; F21V *7/04*

U.S. Cl. 362—26 7 Claims



1. A pointer illuminating structure in a measuring instrument comprising

a monolithic transparent pointer element of a generally elongated structure, said transparent pointer element having a light inducing section at an intermediate portion thereof, said light inducing section extending substantially perpendicularly to said generally elongated structure to form a T shape, said transparent pointer element having a substantially flat upper surface and lower surfaces extending from both sides of said light inducing section;

reflective means applied to said lower surfaces; and

said light inducing section being formed with cavity means spaced beneath said flat upper surface and above levels of said lower surfaces, said cavity means being defined by a plurality of reflective surfaces within said transparent pointer element and being open on opposite side faces along a plane normal to said elongated structure and said light inducing section of said transparent pointer element.

4,625,263

ILLUMINATED CONTROL PANEL FOR COMMUNICATION APPARATUS, PARTICULARLY FOR CAR RADIO OR RADIO-RECORDER COMBINATION

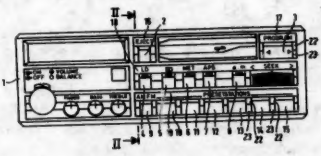
Wolfgang Strohmeier, Hildesheim, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 810,936

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 3511026

Int. Cl.[4] F21V *7/04*

U.S. Cl. 362—32 6 Claims



1. Illuminated control panel for communication apparatus, especially automotive audio apparatus, having

a plurality of operating elements (2–15) located on a panel;

a plurality of light guides (16–19) located with respect to the elements by at least one of: above the operating elements; below the operating elements, and

having a light emitting face surface, said face surface carrying function indicating indicia (Eject, Program, Preset Stations, and the like), and

comprising, in accordance with the invention,

an arrangement to provide for illumination of the operating elements by said light guides, wherein

the light guides extend laterally beyond the operating elements and are formed with an auxiliary light emitting surface (21) positioned, respectively, at least: below; above the light emitting face surface, and

the front plate is formed with a recessed inclined reflecting surface (23) positioned laterally adjacent the operating element and in the path of light (R) emitted from the auxiliary light emitting surface (21),

the light emitted from the auxiliary light emitting surface being reflected by said reflecting surface (23) to permit perception by an operator of the position of the respective control elements in the form of shadows between the light emitted from the auxiliary light emitting surfaces of the light guides and light reflected by the reflecting surfaces of the front plate.

4,625,264

HEADLIGHT DEVICE FOR A VEHICLE

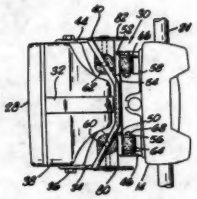
Tomoyuki Nagashima, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,418

Claims priority, application Japan, Feb. 13, 1984, 59-18973[U]

Int. Cl.[4] F21V *15/04, 21/00*; B62J *6/00*

U.S. Cl. 362—72 13 Claims



1. A headlight attachment mechanism for mounting a headlight on a vehicle, comprising

a stay fixed to the headlight including a mounting axis defined in said stay, at least one rod rigidly fixed to said stay, at least one swing piece pivotally mounted to said stay at said mounting axis and a pin fixed to said swing piece at a distance from said mounting axis of said swing piece; and

a resilient mounting block assembly fixed to the vehicle including a first elongate cavity sized for snug receipt of said rod and a second elongate cavity for snug receipt of said pin, said second elongate cavity including a slit extending laterally from said second elongate cavity to the surface of said resilient mounting block assembly for passage of said pin laterally into said second elongate cavity, said second elongate cavity being nonparallel to said first elongate cavity and said pin being forceably pivotable into said second elongate cavity through said slit with said rod in said first elongate cavity.

4,625,265

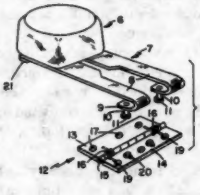
SIGNAL SUPPORTING APPARATUS

Richard R. Busbong, 1406 Prueter St., Saginaw, Mich. 48601

Continuation-in-part of Ser. No. 651,060, Sep. 17, 1984, abandoned. This application May 20, 1985, Ser. No. 736,292

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 362—80 16 Claims



1. Apparatus for mounting a signal device on an automotive vehicle comprising a support; means for securing a signal to said support; anchor means having a pair of relatively movable confronting members between which said support is accommodated; means for mounting one of said members on a vehicle; and cooperable retaining means carried by said support and said anchor means for removably retaining said support between the members of said anchor means.

4,625,266

LIGHTABLE NOSING BAR ASSEMBLY FOR STAIRWAYS

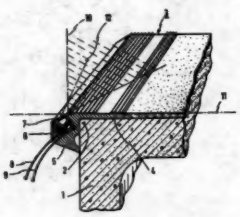
Rolf Winter, Kaspar-Kerll-Str. 2, 8000 München 60, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,902

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404813

Int. Cl.[4] F21S *1/02, 1/14;* E04F *11/00*

U.S. Cl. 362—146 6 Claims



1. A lightable nosing bar assembly comprising a profiled metal rail (3), which is adapted to be secured to a nose edge (2) of a step (1) of a stairway and is provided in a portion of its cross-section that is disposed below the level of the tread with a longitudinally extending recess (6), which at least in a section of its length is exposed toward the free environment in a direction having a horizontal component, also comprising transparent covering means (7) for covering the exposed portions of the longitudinally extending recess, and an illuminating device (8, 9), which is disposed in the recess behind the covering means and extends throughout the length of the nose edge, characterized in that the surface of said covering means (7) is so arranged that at least some points of said surface can be seen from the space which is disposed above the horizontal plane of the tread surface and which in a view in a downstairs direction is defined by a vertical plane which contains the forward boundary of the tread surface.

4,625,267

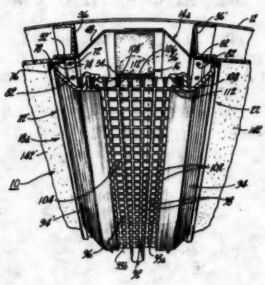
STRIP LIGHTING FIXTURE FOR MASS TRANSIT VEHICLES

Liudas K. Mikalonis, Northville, Mich., assignor to Transmatic, Incorporated, Waterford, Mich.

Filed Sep. 28, 1984, Ser. No. 655,863

Int. Cl.[4] F21S *1/02*

U.S. Cl. 362—150 5 Claims



1. A ceiling-mounted light fixture for mass transit vehicles of the type having plural roof bows spaced along the length of the vehicle, said fixture comprising:

a plurality of lamp housings of inverted channel shape each having first and second mounting flanges along opposite edges and adapted to be mounted to the roof of a vehicle with flanges substantially flush with the ceiling and having a fluorescent lamp therein extending longitudinally thereof,

said lamp housings extending longitudinaly of the vehicle between successive roof bows with the ends of adjacent housings being spaced apart by at least the thickness of said roof bows,

a lens module including a central lens section extending longitudinally of said housings and first and second oppositely disposed side lens sections which are coextensive with said central lens section,

and support means for supporting said lens module from said roof in alignment with said lamp housings and below said ceiling,

said lens module extending the entire length of said plurality of lamp housings and thereby covering said housings and the space between the ends thereof,

said central lens section being a light diffuser for distributing light from said lamps along the entire length of said lens module.

4,625,268

PLEATED MATERIAL FOR A LAMP SHADE

William J. Payne, Greensburg, Pa., assignor to Crown Creative Industries, Greensburg, Pa.

Filed Mar. 12, 1985, Ser. No. 710,845

Int. Cl.[4] F21V *1/06*

U.S. Cl. 362—352 4 Claims

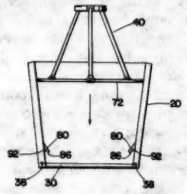
1. A quad fold pleated material with multiple pleats, each of which pleat having a crest and roots, comprising:

a. a first root surface and a second root surface, each of which having a top and connected at a root of successive pleats;

b. a first crest surface and a second crest surface, each of which connect at a crest of the material and at the top of a root surface, said connection being made at a point intermediate of the crest and root;

c. said first root surface and second second root surface being further away from each other at the connection with the root than at the top; and

d. having a first included angle between the connection of the first root surface and first crest surface greater than a



second included angle between the connection of the second root surface with the second crest surface.

4,625,269

HIGH VOLTAGE D-C TRANSMISSION POWER STATION WITH A GENERATOR TRANSFORMER

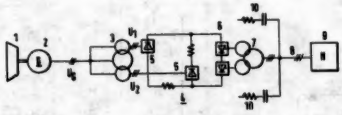
Karl-Werner Kanngiesser, Viernheim, Fed. Rep. of Germany, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Nov. 21, 1984, Ser. No. 674,046

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342210

Int. Cl.⁴ H02J *3/36*

U.S. Cl. 363—35 **5 Claims**



1. High voltage d-c transmission power station, comprising at least one three-phase generator producing a generator voltage, at least one shifting generator transformer having primary windings and having secondary windings with center taps and external terminals, said center taps being connected to said generator for receiving said generator voltage, said external terminals providing voltages in two three-phase voltage systems phase-shifted through 30° relative to each other, and at least one 12-pulse high voltage d-c short coupler having converters connected to said external terminals for receiving said voltages of said two three-phase voltage systems.

4,625,270

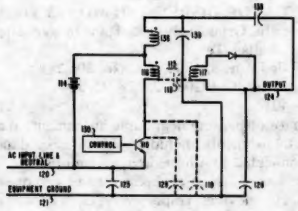
RFI SUPPRESSION TECHNIQUE FOR SWITCHING CIRCUITS

Robert L. Taylor, Denville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 21, 1985, Ser. No. 789,392

Int. Cl.⁴ H02J *1/02*

U.S. Cl. 363—39 **10 Claims**



1. A switching type power supply comprising:

input means for accepting a source of energy,

a power transformer including at least a first transformer winding,

a power switch coupling the input means to the first winding,

an output means coupled to the power transformer,

a first parasitic capacitance coupling the power switch to an equipment ground and a second parasitic capacitance coupling the first transformer winding to equipment ground,

means for suppression of current flow in the first and second parasitic capacitances to equipment ground including:

a voltage source for generating a canceling voltage equal and opposite to a switching transient voltage generating the current flow, and

a neutralizing capacitance for canceling the current flow through the first and second parasitic capacitances.

4,625,271

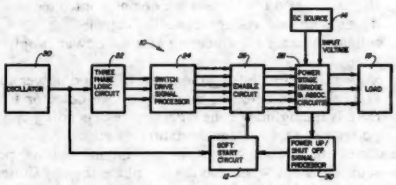
SOFT-START CIRCUIT FOR A POWER CONVERTER

P. R. K. Chetty, Germantown, Md.; Gary Galloway, Marseilles, and Pierre Thollot, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 5, 1984, Ser. No. 657,834

Int. Cl.⁴ H02M *7/42*

U.S. Cl. 363—49 **10 Claims**



1. In a power converter having a switch which is operated in accordance with the output of an oscillator to control the flow of power to a load, a softstart circuit for limiting inrush current following turn on of the converter, comprising:

a ramp generator coupled to the oscillator for generating a cycle ramp signal synchronized to and having the same period as the oscillator output, the cycle ramp signal also having an amplitude which periodically increases from a first to a second level;

means for generating a soft-start signal having an amplitude which increases between the first and second levels, the length of time required for the amplitude of the soft-start signal to increase between the levels being substantially longer than the period of the cycle ramp signal;

first means for comparing the cycle ramp signal to the soft-start signal to develop a pulse width modulated enable signal having a series of pulses of gradually increasing pulse width;

a signal processor having an input coupled to the oscillator output and further having an output; and

means coupled to the comparing means and to the oscillator for gating the oscillator output with the pulse width modulated enable signal to derive switch control signals which operate the switch at gradually increasing duty cycles during the time the soft-start signal increases including second means for comparing the pulse widths of the pulse width modulated enable signal and the output of the signal processor so that the switch is operated in accordance with the signal having the narrower pulse width.

4,625,272

CONVERTER CONTROL APPARATUS AND METHOD

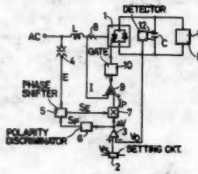
Toshiaki Okuyama, Tokai, and Yuzuru Kubota, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP83/00197, § 371 Date Feb. 17, 1984, § 102(e) Date Feb. 17, 1984, PCT Pub. No. WO84/00086, PCT Pub. Date Jan. 5, 1984

PCT Filed Jun. 17, 1983, Ser. No. 582,569

Int. Cl.[4] H02P *13/24;* H02J *3/18*

U.S. Cl. 363—81 10 Claims



1. A power-supply apparatus comprising:
a PWM converter for converting an a-c power supply voltage into a d-c voltage;
a capacitor connected across the d-c output terminals of said PWM converter;
a load connected across the d-c output terminals of said PWM converter;
a voltage comparator for comparing a setpoint value of said d-c voltage with a detected value of said d-c voltage and for producing a voltage deviation signal in accordance therewith, said PWM converter being controlled in accordance with said voltage deviation signal;
a voltage detector for detecting said a-c power supply voltage;
a phase shifter for shifting the phase of an a-c power supply voltage signal detected by said voltage detector toward the advancing side or the lagging side depending upon the polarity of said voltage deviation signal;
a current instruction circuit for multiplying said a-c power supply voltage signal having the phase thereof shifted by said phase shifter by said voltage deviation signal so as to produce a current instruction signal; and
a firing control circuit for controlling the firing operation of said PWM converter in dependence upon said current instruction signal.

4,625,273

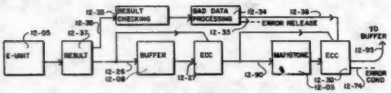
APPARATUS FOR FAST DATA STORAGE WITH DEFERRED ERROR REPORTING

Gary A. Woffinden, Scotts Valley, and Joseph A. Petolino, Jr., Mountain View, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Aug. 30, 1983, Ser. No. 527,672

Int. Cl.[4] G06F *11/00*

U.S. Cl. 364—200 5 Claims



1. In a data processing system, an apparatus for storing and detecting erroneous data, comprising:
execution unit means for performing operations on data and creating execution unit data which is the result of said operations;
first storage means in communication with said execution unit means for storing said execution unit data;
second storage means in communication with said first storage means so that data can be moved out from said first storage means into said second storage means;
execution result checking means connected to the execution unit means in parallel with said first storage means for checking said execution unit data for error;
means for generating a bad data signal when said execution unit data contains an error;
a bad data signal processing means, connected to receive said bad data signal, for causing said erroneous execution unit data to move out from said first storage means into said second storage means and for causing said execution unit data to be stored with an error indication; and
error checking means connected to said second storage means upon move-out of said execution unit data from said second storage means for detecting said error indication and for generating an error signal when said error indication is detected.

4,625,274

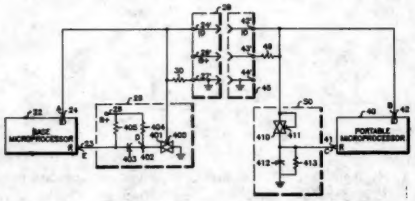
MICROPROCESSOR RESET SYSTEM

Daniel R. Schroeder, Glen Ellyn, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 558,686, Dec. 5, 1983, abandoned. This application May 17, 1984, Ser. No. 611,252

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—200 14 Claims



1. A microprocessor reset system comprising:
a microprocessor having a reset input terminal,
an information line coupled to said microprocessor on which said microprocessor will transmit information data, and
reset means coupled between said information line and said microprocessor reset terminal for providing a reset pulse to said microprocessor in response to an initial predetermined signal transition on said information line which is preceded by the existence of a predetermined voltage level which exists for a predetermined minimum duration of time, said reset circuit effectively ignoring subsequent substantially identical signal transitions which occur on said information line during said transmission of information data unless they are directly preceded by the existence of said predetermined voltage level which exists for at least said minimum duration of time.

4,625,275

APPARATUS FOR DISPENSING MONEY ORDERS

Lawrence G. Smith, Orlando, Fla., assignor to Republic Money Orders, Inc., Dallas, Tex.

Filed Apr. 3, 1984, Ser. No. 596,291

Int. Cl.[4] G06F *15/21, 15/30*

U.S. Cl. 364—401 11 Claims

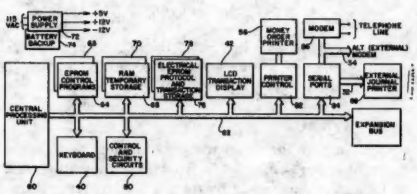
1. A system for dispensing negotiable instruments at a plurality of retail establishments, including one or more data collector devices connected to a host device, comprising:
one or more sets of dispensers connected to said one or more data collector devices, respectively, each of said dispensers including:
digital processing means for controlling the operation of said dispenser;

keyboard means connected to said digital processing means for entering transaction data to request the printing of a negotiable instrument;

display means connected to said digital processing means for displaying said transaction data entered on said keyboard means;

memory means associated with said digital processing means for storing operating programs, transaction and control data, and a security inhibit printing code;

means for detecting the security inhibit printing code;



printing means responsive to said detection means for printing alphanumeric indicia on said negotiable instrument in response to a money order request input to said keyboard means; and

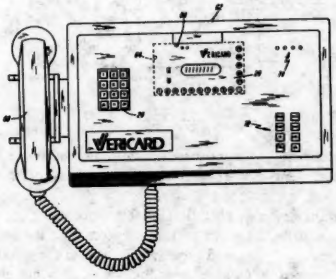
control means responsive to tampering with said dispenser for changing the security inhibit printing code stored in said memory means to thereby prevent operation of said printing means when the security of the dispenser is compromised.

4,625,276

DATA LOGGING AND TRANSFER SYSTEM USING PORTABLE AND RESIDENT UNITS

William M. Benton, Ft. Lauderdale, and William W. Mee, Pompano Beach, both of Fla., assignors to Vericard Corporation, Fort Lauderdale, Fla.

Filed Aug. 31, 1983, Ser. No. 528,112
Int. Cl.[4] G06F *15/30*
U.S. Cl. 364—408 **8 Claims**



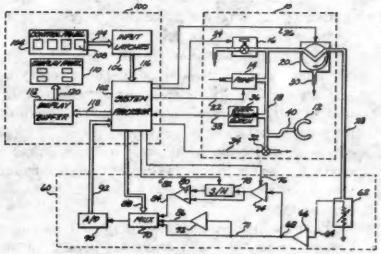
1. An electronic fund transfer system for enabling financial transactions to be carried out between either local or remote users, comprising a plurality of microprocessor controlled modules, each one of said modules including a housing carrying a display and a keyboard for manually entering electronic funds data, said housing containing microprocessor controlled circuitry including a memory, and a first optical interface coupled to the circuitry and extending through the housing to transfer electronic funds data bidirectionally directly with another one of said modules with said modules positioned adjacent each other with said first interfaces thereof in registration, and a plurality of resident units, each of said resident units including a housing having a receptacle to receive one of said portable modules and a second optical interface in said receptacle positioned in optical registration with the first interface of one of said modules seated in said receptacle to couple electronic funds transfer data bidirectionally with said one of said modules seated in said receptacle, said resident unit further including means for transferring data bidirectionally onto external communication lines; and means for controlling electronic funds data transfer bidirectionally (1) directly between local portable modules via only said first optical interfaces thereof or (2) between remote portable modules, indirectly, along external communication lines through the resident units and via said first and second optical interfaces thereof.

4,625,277

BLOOD PRESSURE MEASURING DEVICE HAVING ADAPTIVE CUFF DEFLATION RATE

Christopher Pearce, Redmond, Wash.; Michel A. Lynch, Gainesville, and Richard K. Davis, Altamonte, both of Fla., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Jun. 4, 1984, Ser. No. 617,124
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—416 **10 Claims**



1. A blood pressure measuring device, comprising:

(a) an inflatable cuff adapted for applying pressure to a patient adjacent a blood vessel;

(b) cuff inflation and deflation means;

(c) sensor means for providing sensor signals during cuff deflation corresponding to the cuff pressure and to the blood flow surges in the blood vessel; and

(d) process control means, the process control means further comprising:

(i) means for controlling the cuff inflation and deflation means so as to cause inflation of the cuff to a first pressure and subsequent deflation of the cuff from the first pressure to a lower second pressure at a preestablished deflation rate, the inflation and subsequent deflation of the cuff comprising a measurement cycle;

(ii) calculation means for processing the sensor signals provided during a given measurement cycle and for determining at least one blood pressure value indicative of the patient's blood pressure for that measurement cycle and a pulse rate value indicative of the patient's pulse rate for that measurement cycle; and

(iii) parameter setting means for establishing the deflation rate for a given measurement cycle based upon the blood pressure value determined during at least one previous measurement cycle and the pulse rate value determined during at least one prior measurement cycle.

4,625,278

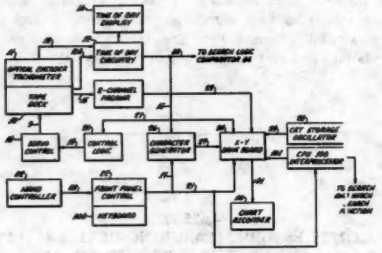
METHOD AND APPARATUS FOR ENHANCING CRT SCREEN MARKINGS IN A PHYSIOLOGICAL DISPLAY SYSTEM

Alan S. Wong, 1238 Via Rancho Pkwy., Escondido, Calif. 92025

Filed Sep. 22, 1983, Ser. No. 534,748

Int. Cl.[4] A61B 5/04; G06F 3/14

U.S. Cl. 364—417 9 Claims



1. A physiological display system comprising:

a CRT storage tube adapted to display real time physiological events in cartesian array format;

computer means for identifying abnormal waveforms;

memory means responsively connected to said computer means for storing the location of abnormal waveforms relative to real time location on said CRT storage tube;

character generating means responsively coupled to said memory means for producing a marker to identify at least one type of abnormal waveform;

program counter means coupled to said memory means for reading memory locations in synchronism with the real time which corresponds to the X-Y location of the waveform on said CRT storage tube;

X-Y sweep deflection means responsively coupled to said character generating means for writing the markers generated by said character generating means on said CRT storage tube;

refreshing means responsively connected to said program counter means and said character generating means for returning said program counter means to its initial state and for causing said program counter means to continuously recycle through each successive memory location whereby said character generation means will rewrite abnormality markers periodically so as to cause such markers to be distinguished from physiological data which is not periodically refreshed.

4,625,279

VEHICLE SPEED CONTROL APPARATUS AND METHOD

Pierre A. Zuber, Baldwin; Norman W. May, Pittsburgh; Robert J. DiSilvestro, Monroeville, and Richard S. Rhoton, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

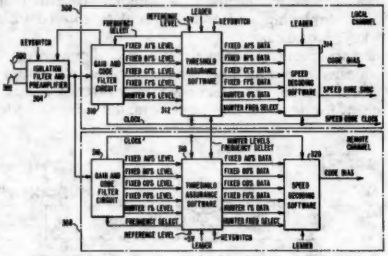
Filed May 11, 1984, Ser. No. 609,253

Int. Cl.[4] B61L 3/20; H04Q 9/00

U.S. Cl. 364—426 10 Claims

1. In apparatus for controlling a vehicle having a propulsion motor and moving along a track providing an input signal in accordance with a desired speed for said vehicle and comprising a plurality of frequency pairs having first and second information components, the combination of

first means for determining the input signal frequency pair having the highest amplitude and including respective fixed frequency filters tuned in relation to one of the first and second information components of each frequency pair and a variable frequency filter tuned in relation to the other of the first and second information components of the highest amplitude frequency pair, and



second means for comparing the highest amplitude frequency pair sensed by a fixed frequency filter and the frequency pair sensed by the variable frequency filter for determining said desired speed input signal for the vehicle.

4,625,280

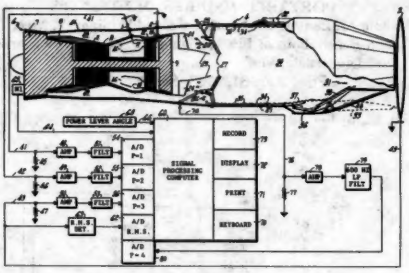
SECTIONAL DISTRESS ISOLATING ELECTROSTATIC ENGINE DIAGNOSTICS

Robert P. Couch, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,115

Int. Cl.[4] G01M 15/00

U.S. Cl. 364—431.02 2 Claims



1. Electrostatic diagnostic apparatus for sensing likely engine wear events occurring in an operating gas turbine engine, comprising:

a plurality of electrostatic signal means, each including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having amplitude variations indicative of the magnitude of electrostatic charge flowing in the gas stream in the vicinity of said probe, said probes being disposed along the gas stream of said engine spaced apart from one another, whereby the gas stream of the engine flows past said probes sequentially;

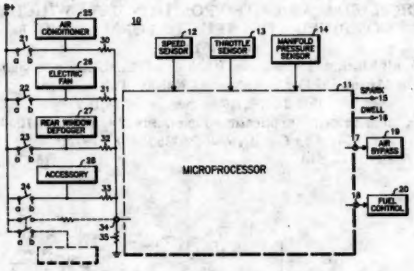
signal processing means connected for response to each of said electrostatic signal means, for selectively providing a particular engine section identifying signal corresponding to the upstream most one of said probes which provides a probe signal indicative of an occurrence of electrostatic charge flowing thereby in excess of a threshold magnitude.

4,625,281

ENGINE LOAD TRANSIENT COMPENSATION SYSTEM

Robert W. Deutsch, Sugar Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1984, Ser. No. 641,117
Int. Cl.[4] F02M 23/06; G06F 7/76
U.S. Cl. 364—431.03 28 Claims



1. An engine load transient compensation system comprising:

a plurality of switch means each of which, in response to actuation thereof, provides an associated digital switch signal which in turn implements providing an associated output load to an engine receiving a predetermined fuel mixture;

circuitry means coupled to said plurality of switch means for receiving said digital switch signals and developing, in response thereto, a composite signal having a signal characteristic related to the total amount of engine load to be provided in accordance with all of said digital switch signals;

transient detection means separate from and coupled to said circuitry means for receiving said composite signal as an input and determining a predetermined change in said signal characteristic over a time interval by monitoring said composite signal, rather than by separately monitoring each of said digital switch signals and for providing, in response thereto, a control signal;

control means coupled to said transient detection means for receiving said control signal and implementing control of said engine in response to said control signal,

wherein said circuitry means receives said digital switch signals and provides in response thereto an analog signal as said composite signal with the magnitude of said analog signal corresponding to said signal characteristic, and said analog signal magnitude being related to the total amount of engine load provided in accordance with actuation of all of said switch means.

4,625,282

POSTAGE METER WITH KEYBOARD KEYS FOR CAUSING DISPLAY OF DATA PERTAINING TO METER OPERATION

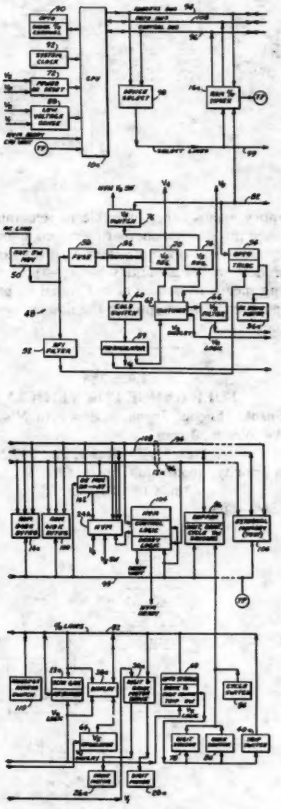
John H. Soderberg, Stratford; Howell A. Jones, Southport; Alton B. Eckert, Norwalk, and Edward C. Duwel, Trumbull, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,919
Int. Cl.[4] G06F 3/02, 15/21
U.S. Cl. 364—466 30 Claims

1. In a postage meter having means for entering data, means for displaying numerical values and other data, means for printing postage, computer means electrically connected to each of the aforesaid means and programmed for processing data for controlling the operation thereof, wherein said data entering means includes a keyboard having a plurality of depressable numeric keys, and wherein said computer means includes means for storing data and calculating amounts pertaining to the operation of said postage meter, an improvement for displaying data pertaining to the operation of said postage meter, the improvement comprising:

(a) said keyboard including a depressable special purpose key;

(b) said computer means programmed for causing said displaying means to display a numerical value in response to the depression of selected numeric keys;



(c) said computer means programmed for automatically processing said numerical value on display in response to the depression of said special purpose key; and

(d) said computer means programmed for automatically causing said displaying means to display data pertaining to the operating of said postage meter in response to the depression of said special purpose key when said displayed numerical value is a predetermined value.

4,625,283

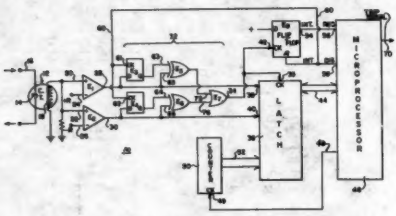
METHOD AND APPARATUS FOR DIGITALLY MEASURING ALTERNATING CURRENT

James R. Hurley, Brookfield, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Filed May 7, 1982, Ser. No. 375,830
Int. Cl.[4] H02H 3/08; G06F 15/324; G01R 19/04
U.S. Cl. 364—487 22 Claims

8. An apparatus for measuring and monitoring an alternating

current including: means for developing a voltage waveform directly related to the alternating current to be measured and monitored; first sensing means for sensing when the voltage waveform crosses a predetermined negative reference voltage; memory means for remembering the point in time t_1 when this occurs; second sensing means for sensing when the voltage waveform crosses a predetermined positive reference voltage;



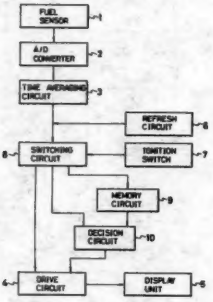
said memory means being operable to remember the point in time t_2 when this occurs; comparing means associated with said memory means and operable therewith for comparing t_2-t_1 with a predetermined ΔT and, when t_2-t_1 is less than ΔT, said comparing means causes a control signal to be generated for actuating a circuit interrupter in the line carrying the alternating current.

4,625,284

FUEL GAUGE FOR VEHICLES

Koichi Suzuki, Fuchu, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 12, 1984, Ser. No. 660,204
Claims priority, application Japan, Oct. 14, 1983, 58-190965
Int. Cl.[4] G01F *23/18*
U.S. Cl. 364—509 **11 Claims**



1. A fuel gauge for indicating the residual quantity of fuel contained in a fuel tank, comprising:

an ignition switch;

a fuel sensing means for detecting a level of fuel contained in the fuel tank;

a calculating means having an output for calculating a residual quantity of fuel according to said level;

memory means, responsive to the ignition switch, for storing said residual quantity calculated by said calculating means upon deactivation of the ignition switch;

displaying means for displaying said residual quantity of fuel in the fuel tank; and

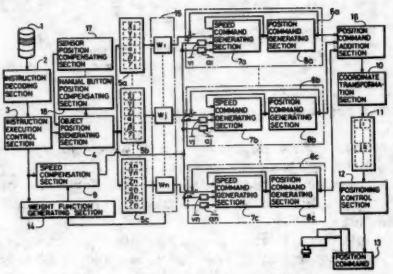
switching means responsive to operation of the ignition switch for selectively providing one of said calculating means output and said stored residual quantity to said displaying means, wherein said switching means provides said stored residual quantity when the ignition switch has been activated less than a predetermined period of time and fuel has not been added to the fuel tank, and said switching means provides said calculating means output when the ignition switch has been activated for said predetermined period of time.

4,625,285

ROBOT CONTROLLER WITH PARALLEL PROCESSING OF PLURAL WEIGHTED POSITION DATA WHICH IS COMBINED AT OUTPUT TO FORM A SINGLE COMMAND

Shunji Mori, and Masanobu Ito, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,169
Claims priority, application Japan, Jun. 14, 1983, 58-106035
Int. Cl.[4] G05B *19/407*; B25J *9/00, 13/00*
U.S. Cl. 364—513 **15 Claims**



1. A robot controller comprising:

movement command forming means for specifying generation of a plurality of movement object positions of a robot in response to an operating instruction;

object position variable forming means for correcting a plurality of movement object positions specified by said movement command forming means to provide object position variables;

object position variable compressing/enlarging means for weighting a plurality of object position variables with weight functions representing dependencies of said object positions in movement to said object positions;

a plurality of position control means for receiving said plurality of object position variables weighted by said compressing/enlarging means to perform speed control and position control in said movement;

object position command means including a position command adding section for adding output signals of said plurality of position control means to output an object position command; and

a drive section for outputting signals to drive said robot according to object position commands outputted by said object position command means.

4,625,286

TIME ENCODING OF LPC ROOTS

Panos E. Papamichalis, and George R. Doddington, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1982, Ser. No. 373,960
Int. Cl.[4] G10L *5/00*
U.S. Cl. 364—513.5 **13 Claims**

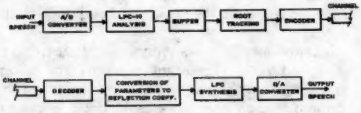
1. A method for LPC encoding of speech, comprising the steps of:

providing, at each of a plurality of repeated frame intervals, a set of speech parameters;

grouping said frame intervals into segments, such that each

of said speech parameters varies smoothly from frame to frame within each of said segments;

successively approximating values of each respective one of said parameters within each said respective segment, with linear combinations of orthogonal functions of successively higher order, until a final one of said linear combinations provides a predetermined degree of approximation to said respective parameter within said respective segment; and



encoding, for each said respective segment, the number of frames within said segment, and, for each respective parameter within said respective segment,

the order of said orthogonal functions in said final linear combination which provides said predetermined degree of approximation, and

the respective coefficients of each of said orthogonal functions in said respective final linear combination.

4,625,287

MONOSYLLABLE RECOGNITION APPARATUS

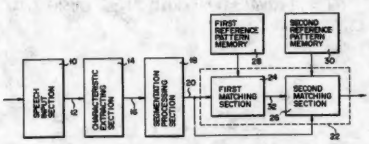
Hiroshi Matsuura, Odawara, and Tsuneo Nitta, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 12, 1983, Ser. No. 541,029

Claims priority, application Japan, Oct. 19, 1982, 57-183411

Int. Cl.[4] G10L *5/00*

U.S. Cl. 364—513.5 **12 Claims**



1. An apparatus for recognizing, in units of monosyllables, speech which is produced by a speaker in accordance with a predetermined language system and which is input to said apparatus, comprising:

(a) first memory means for storing reference vowel patterns which respectively represent first categories of a first number which are, in turn, obtained by classifying a group of known reference monosyllables in accordance with types of vowel characteristic phoneme of the language system, said first categories including independent categories corresponding to a contracted sound and a syllabic nasal sound in addition to categories corresponding to basic vowels;

(b) second memory means for storing reference consonant patterns of a second number which respectively represent the group of reference monosyllables which are, in turn, classified in accordance with types of consonant characteristic phonemes of the language system;

(c) first processing means for converting the input speech into electrical signals and for generating acoustic parameter data of the input speech in accordance with the electrical signals;

(d) second processing means, connected to said first processing means, for performing segmentation for dividing the acoustic parameter data into monosyllabic acoustic parameter components corresponding to monosyllables of the input speech; and

(e) third processing means, connected to said second processing means and said first and second memory means, for comparing each monosyllabic acoustic parameter component among the monosyllabic acoustic parameter components with the reference vowel and consonant patterns so as to perform monosyllable recognition in accordance with determination of which first category of the reference vowel patterns and which second category of the reference consonant patterns maximally resemble the each monosyllabic acoustic parameter component of the input speech.

4,625,288

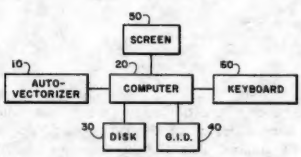
METHOD AND APPARATUS FOR CREATING A STRUCTURED IMAGE DATA SET BASED ON ACQUIRED IMAGE DATA

Herbert S. Weiner, Milwaukie; William L. Mills, Beaverton, both of Oreg.; Charles E. Perkins, Peekskill, N.Y.; Chi-Leung Lau, Aloha, Oreg.; Jeffrey P. Mayhew, Portland, Oreg., and Samuel Y. Gordon, Tualatin, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 1, 1984, Ser. No. 656,611

Int. Cl.[4] G06F *15/26*

U.S. Cl. 364—521 **12 Claims**



1. A method of creating a structured image data set based on acquired image data, comprising the steps of:

creating a template based on the acquired image data and displaying this template on a computer controlled screen,

selecting portions of the template to be used for the construction of a new drawing superimposed on the display template, and

saving the new drawing as a structured image data set.

4,625,289

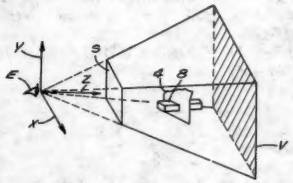
COMPUTER GRAPHICS SYSTEM OF GENERAL SURFACE RENDERING BY EXHAUSTIVE SAMPLING

Alyn P. Rockwood, Centerville, Utah, assignor to Evans & Sutherland Computer Corp., Salt Lake City, Utah

Filed Jan. 9, 1985, Ser. No. 690,553

Int. Cl.[4] G06F *15/68*

U.S. Cl. 364—522 **11 Claims**



1. A computer graphics system for processing data representative of objects as to provide an image to a viewer, comprising:

means providing a coordinate array register;

means for providing said data as coordinate signals representative to points to exhaust the display surface and with greater resolution than said coordinate array register, said points being defined on said objects in viewing screen coordinates; and

means for testing said coordinate signals for registration in

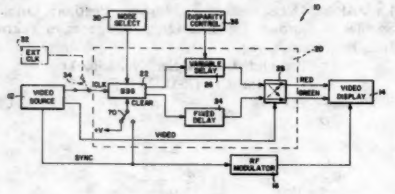
said coordinate array register whereby to selectively register signals for viewing screen coordinates nearest to said viewing screen as to eliminate hidden components to the image.

4,625,290

APPARATUS AND METHOD FOR PRODUCING A THREE-DIMENSIONAL DISPLAY ON A VIDEO DISPLAY DEVICE

Keith D. White, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Nov. 2, 1983, Ser. No. 547,952
Int. Cl.[4] G09B *9/08*
U.S. Cl. 364—522 **34 Claims**



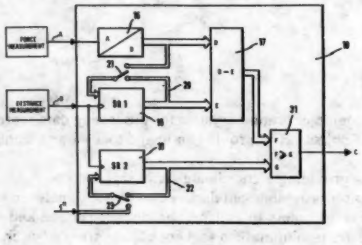
1. Apparatus for producing a three-dimensional display on a video display device of the type which displays images in frames composed of a plurality of scan lines, the apparatus comprising element generator means for generating signals corresponding to pairs of elements to be displayed on the video display device, means for applying said signals to the video display device such that the elements constituting an element pair are displayed on the same scan line of the video device, a video signal source for producing a video signal defining a predetermined image, and means responsive to the video signal for producing disparity between the elements of the pairs of elements displayed during selected portions of the predetermined image such that said selected portions appear to be at a different distance from a viewer than non-selected portions of the predetermined image.

4,625,291

PROCESS FOR MONITORING A DRIVEN, MOVABLE DOOR OR THE LIKE

Michael K. Hormann, Steinhagen, Fed. Rep. of Germany, assignor to Hormann KG, Harsewinkel, Fed. Rep. of Germany

PCT No. PCT/DE83/00002, § 371 Date Sep. 9, 1983, § 102(e) Date Sep. 9, 1983
PCT Filed Jan. 11, 1983, Ser. No. 537,366
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1982, 3200511
Int. Cl.[4] G05B *1/03*; G05D *3/20*; E05F *15/16*
U.S. Cl. 364—550 **47 Claims**



1. An apparatus of monitoring the movement of a drivable, single-piece or multipiece leaf of a door along a track between an open position and a closed position and for interrupting this movement when said door encounters an obstacle in the path of the door as said door moves, comprising:

a door;

a track guiding said door in a predetermined path and allowing said door to open and close;

a motor connected to said door for providing a driving force to open or close said door;

sampling means for continuously sampling the value of said driving force used to open or close said door;

means for receiving the position of said door relative to said track;

comparator means operatively connected to said sampling and said receiving means whereby the sampled force dependent on the motor driving force when driving said door, for each position of said door, is compared with recorded sample force applied by the motor when driving said door under a previous recorded condition when said path of the door is free from an obstacle, said comparator means having an output providing a difference signal representing a variation in the driving force of said motor for a given position of said door;

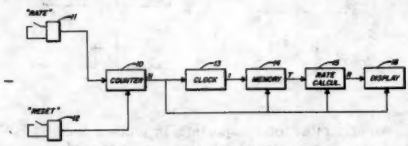
and means for comparing said difference signal to a preset difference signal and generating an interrupt signal for interrupting movement of the door when said present difference value is exceeded.

4,625,292

MANUAL ENTRY RATE CALCULATOR HAVING CONTINUOUS UPDATING CAPABILITY

James H. Philip, Chestnut Hill, Mass., assignor to The Massachusetts General Hospital, Boston, Mass.

Continuation of Ser. No. 512,696, Jul. 11, 1983, abandoned, which is a continuation of Ser. No. 138,312, Apr. 8, 1980, abandoned. This application May 30, 1985, Ser. No. 739,492
Int. Cl.[4] G06F *15/36*; G01R *23/02*; G06M *3/00*
U.S. Cl. 364—569 **9 Claims**



1. A rate calculator for calculating, displaying and updating the rate of occurrence of observable events, said calculator comprising:

switch means for manually entering a signal upon observation of the occurrence of each observable event;

counter means responsive to each of said signals of said switch means for counting entered signals to provide a sequence of a first, second and further event indicative signals;

clocked means responsive to the first event indicative signal and successively responsive to the second and further event indicative signals from said counter means for successively providing a corresponding one of plural lapsed time signals respectively representing accumulated total time duration from said first event indicative signal successively to each of said second and further event indicative signals;

processor means successively responsive to individual ones of the plural elapsed time signals representing accumulated total time duration of said clocked means and to the corresponding one of the numeric sequence of said first, second and further event indicative signals of said counter means for computing a running average representative of the rate of occurrence of said event indicative signals, for each event indicative signal beyond the first, using individual ones of said plural elapsed time signals correspond-

ing to each event signal beyond the first, so as to provide plural running average signals respectively representative of rate of occurrence of each of said event indicative signals beyond the first, the most recent of said plural running average signals is retained as a final average until further operator activation of the switch means; and

display means responsive to the computed rate of occurrence of event indicative signals for displaying said computed rate as the rate of occurrence of said events for each event beyond the first;

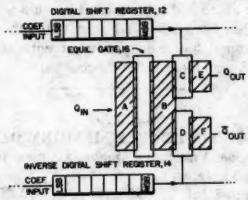
said display means displaying an updated rate of occurrence after and only after each signal entered by said switch means beyond the first whereby each running average signal is retained and displayed as the final average until activation of the switch means.

4,625,293

PARALLEL PROGRAMMABLE CHARGE DOMAIN DEVICE

Thomas L. Vogelsong, Clifton Park, and Jerome J. Tiemann, Schenectady, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 7, 1984, Ser. No. 679,327
Int. Cl.[4] H01L 29/78; G06G 7/16
U.S. Cl. 364—606 **2 Claims**



1. A parallel programmable charge domain device for multiplying a sampled analog signal represented by a quantity of stored charge by a multiple bit digital word coefficient comprising:

a semiconductor substrate having electrodes insulatively disposed thereon to which signal potentials are applied for inducing wells in said substrate for the storage and propagation of packets of charge therein;

an input signal charge storage well formed in said substrate;

means for introducing a charge packet in said input signal charge storage well having a magnitude corresponding to the value of an applied analog signal;

a plurality of charge splitter wells formed in said substrate;

means for simultaneously distributing substantially the entire charge packet in said input signal charge storage well among said plurality of charge splitter wells;

individual ones of said plurality of charge splitter wells except the last one of said plurality of charge splitter wells receiving a $\frac{1}{4}^N$ fractional portion of the charge packet in said input signal charge storage well, where N is an integer denoting the ordered number of an individual one of said plurality of charge splitter wells;

said last one of said plurality of charge splitter wells receiving the same fractional portion of the charge packet in said input signal charge storage well as the penultimate one of said plurality of charge splitter wells;

a first and a second charge accumulator well formed in said substrate;

first charge transfer gating means associated with individual ones of said plurality of charge splitter wells for selectively enabling the transfer of the charge packets stored therein to said first charge accumulator well;

second charge transfer gating means associated with individual ones of said plurality of charge splitter wells for selectively enabling the transfer of the charge packets stored therein to said second charge accumulator well;

means for applying the ordered bits of a multiple bit digital word to said first charge transfer gating means starting with the application of the most significant bit of said digital word to the lowest ordered individual one of said plurality of charge storage wells, a bit of one value enabling the transfer of the charge packet in the associated individual one of said plurality of charge splitter wells to said first charge accumulator well;

means for applying the complementary ones of said ordered bits of said multiple bit digital word to said second charge transfer gating means starting with the application of the most significant complementary bit of said digital word to the lowest ordered individual one of said plurality of charge storage wells, a complementary bit of said one value enabling the transfer of the charge packet in the associated individual one of said plurality of charge splitter wells to said second charge accumulator well; and

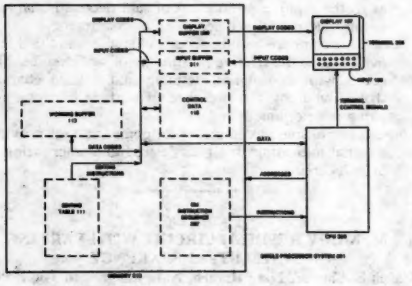
charge combiner means coupled to said first and said second charge accumulator wells for providing an output signal whose value corresponds to the difference in the magnitudes of the charge packets stored in said first and said second charge accumulator wells.

4,625,294

TABLE-DRIVEN APPARATUS FOR DATA DISPLAY AND MODIFICATION

Edwin R. Banks, Cary, N.C., assignor to Data General Corporation, Westboro, Mass.

Filed Mar. 15, 1982, Ser. No. 358,543
Int. Cl.[4] G06F 3/153
U.S. Cl. 364—900 **20 Claims**



1. In a data processing system, editing means for modifying data codes comprising:

(1) receiving means for receiving input codes in said editing means;

(2) memory means including

(a) buffer memory means for storing said data codes and

(b) editing table memory means for storing an editing table including

(i) editing instruction sequences corresponding to said input codes for specifying editing operations modifying said data codes in said buffer memory means; and

(3) processing means connected from said receiving means and said memory means, said processing means including

(a) means for receiving said input codes from said receiving means,

(b) means for determining the location in said editing table of a corresponding said editing instruction sequence corresponding to each said input code,

(c) means for receiving said editing instructions of said corresponding said editing instruction sequence, and

(d) means, responsive to said editing instructions of said

corresponding said editing instruction sequence, for modifying said data codes in said buffer memory means.

4,625,295

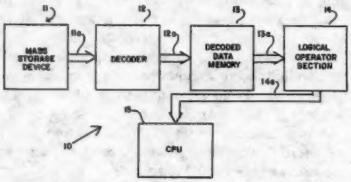
TEXTUAL COMPARISON SYSTEM FOR LOCATING DESIRED CHARACTER STRINGS AND DELIMITER CHARACTERS

James T. Skinner, 780 Yale Rd., Boulder, Colo. 80303

Continuation-in-part of Ser. No. 342,620, Jan. 25, 1982, Pat. No. 4,531,201. This application Jan. 12, 1983, Ser. No. 456,989

Int. Cl.[4] G06F *7/04*

U.S. Cl. 364—900 **11 Claims**



1. A textual comparison system for locating a desired character string within textual material formed from a predefined sequence of characters comprising:

means for sequentially receiving a plurality of stored textual characters;

means for sequentially decoding said plurality of stored textual characters as they are received, thereby providing a sequence of decoded characters, said means for decoding including means for being programmed to detect only characters forming a part of said desired character string;

means for storing said decoded characters and information as to the relative positioning of said decoded characters within said predefined sequence of characters;

means for comparing said decoded characters and said information as to the relative positioning of said decoded characters with information defining said desired character string, whereby the presence of said desired character string is determined; and

means responsive to said means for comparing for providing a signal indicating that said desired character string has been located.

4,625,296

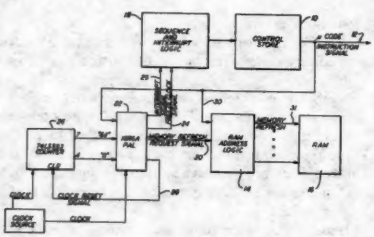
MEMORY REFRESH CIRCUIT WITH VARYING SYSTEM TRANSPARENCY

Joseph S. Shriver, Long Branch, N.J., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 17, 1984, Ser. No. 571,608

Int. Cl.[4] G06F *12/16*; G11C *7/00*

U.S. Cl. 364—900 **9 Claims**



1. In a system including a clock source for generating a clock signal, a system machine cycle being determined by reference to the clock signal, a refreshable memory means, a sequence and interrupt logic circuit, and a control store for producing micro-code instruction signals each system machine cycle in response to addresses generated by the sequence and interrupt logic circuit, a memory refresh request circuit comprising, in combination:

a counter, responsive to the clock signal, for producing at least one count signal representing at least one count of the clock signal, the counter also being responsive to a clock reset signal to reset the counter;

an array logic device, responsive to the at least one count and to the micro-code instruction signals,

(a) for producing a memory refresh request signal and the clock reset signal when a specified count has been achieved,

(b) for producing a freeze clock signal to block further sequencing of the sequence and interrupt logic circuit during a machine cycle referred to as an after cycle, which after cycle follows a machine cycle referred to as a start cycle, when the micro-code instruction signal to be executed during the after cycle requires an access to the memory means, a start cycle being determined by the array logic device to occur when the memory refresh request signal has been produced and the micro-code instruction signal to be executed during that machine cycle does not require an access to the memory means, and

(c) for producing an interrupt signal which is input into the sequence and logic circuit when a second specified count has been achieved after the memory refresh request signal has been produced without a start cycle being determined to have occurred.

4,625,297

MAGNETIC-BUBBLE MEMORY DEVICE

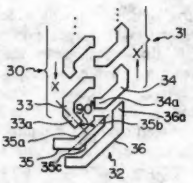
Takeyasu Yanase, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 14, 1983, Ser. No. 513,657

Claims priority, application Japan, Jul. 17, 1982, 57-123767

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—39 **13 Claims**



1. A magnetic-bubble memory device in which magnetic bubbles are driven by a magnetic drive field, comprising:

a magnetic layer in which the magnetic bubbles can be propagated; and

a bubble propagation path along which the bubbles in said magnetic layer can be propagated in response to the magnetic drive field rotating in the plane of said magnetic layer, said bubble propagation path comprising:

first and second tracks, extending in different bubble propagation directions, comprising hook-shaped propagation patterns of magnetically soft material, including first and last patterns in each of said first and second tracks, each of the hook-shaped propagation patterns having a first end portion, a second end portion and an outer edge, said hook-shaped propagation patterns arranged in the bubble propagation directions with the second end portion of a preceding pattern not parallel to the first end portion of the succeeding pattern and the second end portion of the preceding pattern disposed

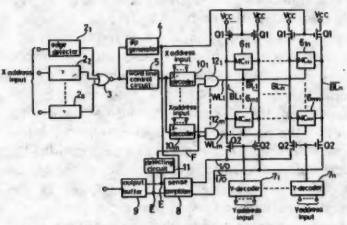
opposite and separated from the outer edge of the succeeding pattern; and

a turn, interconnecting the first and second tracks, comprising a crooked bar-shaped pattern of magnetically soft material having an exit end portion with an inner edge, the second end portion of the last pattern in said first track disposed opposite and separated from the inner edge of the exit end portion of said crooked bar-shaped pattern, the exit end portion of said crooked bar-shaped pattern disposed adjacent to and separated from the first end portion of the first pattern in said second track, whereby the magnetic bubbles propagate from the last pattern in said first track, via said crooked bar-shaped pattern, to the first pattern in said second track.

4,625,298
SEMICONDUCTOR MEMORY DEVICE

Tadashi Sumi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1984, Ser. No. 641,551
Claims priority, application Japan, Sep. 14, 1983, 58-170679
Int. Cl.⁴ G11C 7/00
U.S. Cl. 365—190 **6 Claims**



1. A semiconductor memory device with a static Random Access Memory having an internally generated timing system, comprising:

a plurality of memory cells;

a plurality of word lines connected to said memory cells for selecting one of said plurality of memory cells for a read/-write operation;

sensing means for sensing a data reading output of said one of said plurality of memory cells;

detecting means responsive to said sensing signal for producing a control signal when a sensing operation is completed; and

control means responsive to said control signal for placing said word lines in an unselected state.

4,625,299
BIPOLAR RANDOM ACCESS MEMORY

Hideaki Isogai, Higashikurume, and Isao Fukushi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 25, 1984, Ser. No. 573,610
Claims priority, application Japan, Jan. 31, 1983, 58-014057
Int. Cl.⁴ G11C 7/00
U.S. Cl. 365—189 **4 Claims**

1. A bipolar random access memory device, comprising:

a plurality of pairs of word lines;

a plurality of pairs of bit lines, said word lines and said bit lines intersecting at a plurality of intersections;

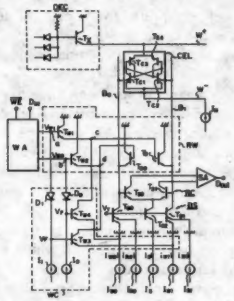
a plurality of static memory cells, each static memory cell being connected between a pair of word lines and a pair of bit lines at a corresponding one of the intersections;

means, operatively connected to said bit lines, for selecting the bit lines;

a plurality of constant current sources operatively connected to said selecting means;

a reading-writing voltage control circuit, comprising a pair of firt transistors, an emitter of one of the first transistors being connected to one bit line of the pair of bit lines and an emitter of the other one of the first transistors being connected to the other one bit line of the pair of bit lines, for controlling the potential of each of said bit lines during the reading and writing of data; and

a writing current control circuit comprising a pair of second

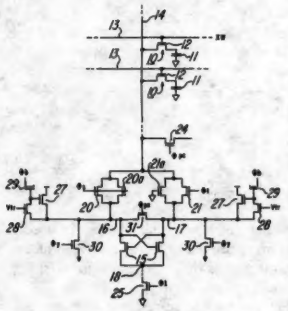


transistors, an emitter of each of the second transistors being connected to the constant current sources, for selectively, operatively connecting respective ones of said constant current sources to the base of respective ones of the first transistors during the writing of data into said memory cell and for controlling the current flowing to each of each bit lines during the writing of data into said memory cell.

4,625,300
SINGLE-ENDED SENSE AMPLIFIER FOR DYNAMIC MEMORY ARRAY

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 445,813, Dec. 1, 1982, abandoned. This application Jun. 4, 1985, Ser. No. 741,205
Int. Cl.⁴ G11C 7/00, 11/40
U.S. Cl. 365—205 **6 Claims**



1. A memory device comprising:

an array of rows and columns of dynamic memory cells storing data on storage capacitors, each cell having an access transistor with its drain connected to a column line and its gate connected to a row line,

a single-ended differential sense amplifier connected to each column line, each sense amplifier including a pair of cross-coupled driver transistors and first and second separate coupling transistors, each transistor having a source-drain path and a gate, means connecting the source-drain path

of the first coupling transistor between the column line and a first sense node, means connecting the source-drain path of the second coupling transistor between the column line and a second sense node, the source-drain paths of the driver transistors separately connecting the first and second sense nodes to a grounding node, said first sense node having more capacitance than said second sense node,

precharge means for precharging the column lines to a selected voltage prior to the beginning of an active cycle,

a first clock voltage applied to the gates of the first coupling transistors in the sense amplifiers to turn off the first coupling transistors at a first time at the beginning of an active cycle,

row addressing means for applying an activating voltage to the gates of said access transistors in a selected row by one of said row lines at about said first time,

a second clock voltage applied to the gates of the second coupling transistors in the sense amplifiers to turn off the second coupling transistors at a second time in said active cycle after said first time,

wherein grounding means connects said grounding node to reference potential at a third time which is after said first time in said active cycle,

wherein said second clock voltage goes high again after said third time in said active cycle to thereby refresh the selected memory cell via said column line,

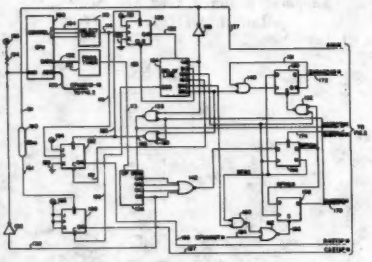
and wherein each of said first and second coupling transistors has a separate counterpart transistor in parallel therewith, the gate of the counterpart transistor of the first coupling transistor being connected to said first clock voltage, the gate of the counterpart transistor of the second coupling transistor being connected to ground.

4,625,301

DYNAMIC MEMORY REFRESH CIRCUIT

Michael F. Berger, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Nov. 30, 1983, Ser. No. 556,467
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—222 **18 Claims**



1. A memory refresh circuit for use in a computer system having a central processing unit and a dynamic memory including memory cells requiring periodic refreshing, said memory refresh circuit comprising,

means for producing refresh request signals at predetermined intervals;

means responsive to said refresh request signals for storing said request signals;

means responsive to stored refresh request signals and responsive to a memory access by said central processing unit for starting a memory refresh cycle; and

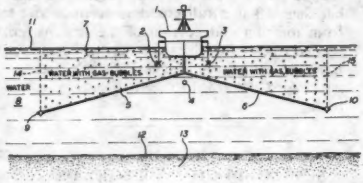
means responsive to the end of a refresh cycle and to said stored refresh request signals for immediately starting another memory refresh cycle so that refresh cycles are continuously performed until a refresh cycle has been performed for each stored refresh request signal.

4,625,302

ACOUSTIC LENS FOR MARINE SEISMIC DATA MULTIPLE REFLECTION NOISE REDUCTION

William H. Clark, Calgary, Canada, assignor to Exxon Production Research Co., Houston, Tex.

Filed Oct. 24, 1983, Ser. No. 544,666
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—24 **3 Claims**



1. Apparatus for use in gathering seismic data in an area covered by a body of water having a surface, comprising:

a seismic vessel;

a seismic source towed by the seismic vessel for generating in the body of water an acoustic wave which will penetrate to and be reflected from at least one reflective horizon located below the body of water;

a streamer towed by the seismic vessel in the body of water below its surface, including at least one hydrophone for detecting the acoustic wave reflected from said at least one reflective horizon;

a first gas dispensing tube and a second gas dispensing tube disposed in the water adjacent said vessel, said tubes each having a side wall and a plurality of perforations through said side wall for permitting gas bubbles to escape into the water;

a first paravane attached to said first tube;

a second paravane attached to said second tube; and

control means connected to the first paravane and to the second paravane for controlling the position of said paravanes relative to the streamer so that gas bubbles escaping from said first tube and said second tube occupy a zone of water so as to form an acoustic lens located so that the acoustic wave reflected from said at least one reflective horizon will be refracted in the zone so as to reduce the intensity of noise incident on said at least one hydrophone due to the re-reflection of the acoustic wave from the surface of the body of water, said zone having a bottom surface facing said streamer shaped so that the distance between the surface of the body of water and the bottom surface of the zone increases with increasing distance from the axis of the streamer.

4,625,303

AUTOMATIC FOCUSING DEVICE

Shinsuke Shikama; Mitsushige Kondou; Nobumasa Egashira, and Kazuo Okada, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,124
Claims priority, application Japan, Sep. 5, 1983, 58-162823
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—45 **6 Claims**

1. An automatic focusing device for an optical disk head, comprising:

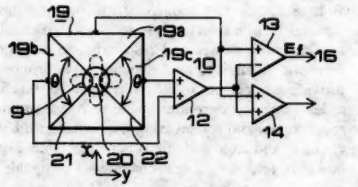
an objective lens for focusing the light beam emitted from a light source on the track of an information recording medium;

a beam splitter capable of separating the light beam emitted from the light source and the reflected light beam reflected by the information recording medium at the focal spot thereon and transmitted through the objective lens from each other;

an astigmatic optical system including an optical element

capable of causing the astigmatic aberration of the reflected light beam separated from the light beam emitted from the light source;

a light detector having a light receiving surface divided, by two division lines which are bent in the vicinity of the center of the light receiving surface, into a central light receiving section formed symmetrically with respect to an x-axis extending through the center in parallel to the axis of the optical element and with respect to a y-axis extending perpendicularly to the x-axis and having a constricted central portion, and two side light receiving sections formed symmetrically with respect to both the x-axis and the y-axis and arranged with the respective apexes thereof



opposed, and adapted to receive the reflected light beam through the optical element and to give a detection output signal corresponding to the variable shape of the spot of the reflected light beam formed on the light receiving surface thereof;

a focal position detecting circuit capable of giving a signal corresponding to the deviation of the information recording medium from the focal point of the objective lens, on the basis of the detection output signal given by the light detector; and

a lens driving circuit adapted to drive the objective lens along the optical axis on the basis of the output signal given by the focal position detecting circuit.

4,625,304

AUTOMATIC LOADING DISC PLAYER

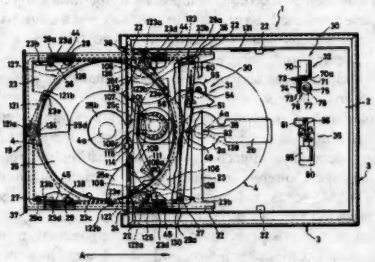
Hitoshi Kanamaru; Tadashi Funabashi; Junji Takahashi, and Kyoichi Kato, all of Saitama, Japan, assignors to Pioneer Electronic Corp., Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,775

Claims priority, application Japan, Mar. 11, 1983, 58-35332[U]

Int. Cl.⁴ G11B *1/00, 17/04, 25/04*

U.S. Cl. 369—75.2 **8 Claims**



1. An automatic loading disc player comprising:

(a) a turntable for rotating a disc to be played;

(b) a disc transfer mechanism for carrying and transferring said disc into a predetermined playback position on said turntable; and

(c) positioning means for positioning said disc in a predetermined position on said disc transfer mechanism, said positioning means comprising at least three angularly movable positioning levers having ends engageable with the outer peripheral edge of said disc, and synchronous drive means operatively coupled between said positioning levers for angularly moving said positioning levers in synchronism, thereby being drivable in synchronous coaction with a transferring operation of said disc transfer mechanism, said positioning means being releasable from engagement with said disc while the disc is being played back.

4,625,305

MULTIPLEXING OF OPTICAL SIGNALS

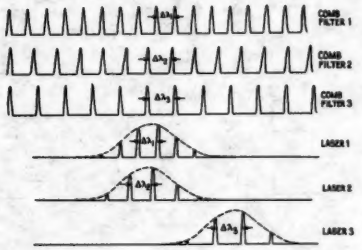
Richard E. Epworth, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,755

Claims priority, application United Kingdom, Sep. 1, 1981, 8126498

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 370—1 **14 Claims**



1. A method of transmitting a plurality of multiplexed optical signal channels in a common optical path, comprising the steps of

generating the individual optical signal channels in respective multimode injection lasers having respective overall cavity lengths arranged to each produce a multimode spectral output having associated spectral components with an intermode spacing differing from that between the spectral components of the output of each of the other lasers for channel discrimination purposes;

multiplexing the individual optical signal channels into the common optical path for propagation as a combined optical signal in the latter; and

optically demultiplexing the combined optical signal to reconstitute the individual optical channels from the respective associated spectral components by discrimination on the basis of the respective intermode spacings.

4,625,306

DATA SIGNAL SWITCHING SYSTEMS

Peter Newman, Middlesex, England, assignor to The General Electric Company, p.l.c., England

Filed Nov. 30, 1984, Ser. No. 677,065

Claims priority, application United Kingdom, Dec. 16, 1983, 8333519

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—60 **5 Claims**

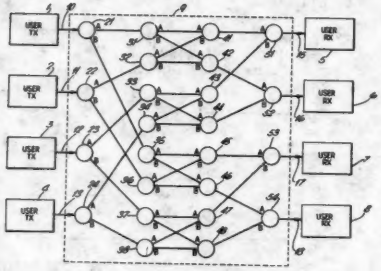
1. A digital data signal switching system for transmitting messages via a plurality of selectable transmission paths each of which connects one of a plurality of inputs of the system to one of a plurality of outputs of the system, each said message transmitted from an input of the system being a string of digital data at least the first digit of which defines a route through the system, said system comprising:

a plurality of distributor switches and a plurality of concentrator switches interconnected to provide said plurality of

selectable transmission paths and also to provide a plurality of selectable backward paths each one in parallel with a respective one of said transmission paths;

each said distributor switch being a switch having a transmission path input and a plurality of transmission path outputs to any one of which the input may be exclusively and selectively connected, and being arranged to respond to the first digit of a message on arrival at a transmission path input thereof to select a transmission path segment from that input to a transmission path output of the distributor switch together with a parallel backward path segment in dependence upon the value of that first digit and in so doing to omit the first digit from the message passed on, such that in passing through a plurality of said distributor switches the message is progressively shortened by the omission of respective first digits; and

each said concentrator switch being a switch having a plurality of transmission path inputs and a transmission path



output to which any one of the plurality of inputs may be exclusively and selectively connected to provide a transmission path segment through the concentrator switch together with a parallel backward path segment, and being arranged to fail to onwardly transmit a message if contention occurs due to the data string of that message arriving at one of the transmission path inputs of said concentrator switch when an exclusive connection between another transmission path input of the concentrator switch and the output thereof is already in use,

each selected said transmission path and respective parallel backward path between an input of the system and an output of the system being progressively set up by transmission of a message through the distributor switches and concentrator switches, and failure of a transmitted message due to contention being indicated to the respective input of the system by means of an incompletely set up selected backward path.

4,625,307

APPARATUS FOR INTERFACING BETWEEN AT LEAST ONE CHANNEL AND AT LEAST ONE BUS

Bhalchandra R. Tulpule, Vernon, Conn., and Matthew S. Blaha, Cambridge, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1984, Ser. No. 681,172

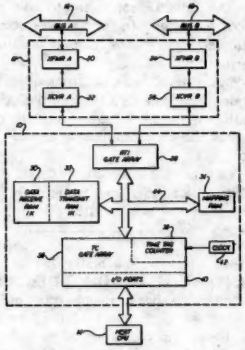
Int. Cl.[4] H04J *3/00*

U.S. Cl. 370—85 **5 Claims**

1. Interface apparatus for a multichannel system for interfacing between at least one asynchronous bus and a selectable one of the channels, each bus having an identical protocol which permits communication between a bus and only one channel at a time, the protocol further defining legal and illegal message signal characteristics stored in each channel, said signals formatted as words of a specified number of bits in messages having a specified maximum number of words, each channel's portion of said interface apparatus comprising:

message validation means, responsive to incoming signals to the channel from an asynchronous bus and responsive to outgoing signals from the channel for transmittal on said bus, for comparing said incoming signals from said bus to stored legal and illegal signal characteristics and providing, in response to a comparison finding an illegal incoming signal characteristic, for interface apparatus interfacing with only one asynchronous bus a channel sever signal, and for similarly providing a channel select signal in response to said comparison for interface apparatus interfacing with more than one asynchronous bus, said validation means comparing said outgoing signals to legal and illegal signal characteristics and providing a channel sever signal in response to a comparison finding an illegal outgoing signal characteristic;

switching circuitry, responsive to incoming signals to the channel from a selected one of a selected number of the asynchronous busses and responsive to outgoing signals from the channel to said selected asynchronous bus, for providing selectable signal paths between the channel and at least one asynchronous bus in response to said channel select signal and for severing the signal path between the channel and any and all other selectable asychronous busses in response to said channel sever signal;



a bus interface circuit, responsive to incoming signals from said selected asynchronous bus and responsive to outgoing signals from the channel to said bus, for efficiently packing and coherently transferring validated incoming and outgoing signals between the channel and said asynchronous bus;

local RAM, responsive to coherent incoming signals for storing said coherent incoming signals in packed form;

an independent interchannel communication link, responsive to said coherent signals stored in each channel's local RAM for synchronously transmitting said signals in packed form to other channels;

link RAM, responsive to said packed signals transferred from another channel on said interchannel link for storing said transferred packed signals; and

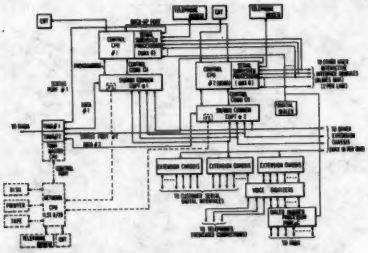
signal processor means, responsive to incoming signals processed by said bus interface circuit for providing packed messages having end of data identification tags for storage in a preselected area of said local RAM and for transmission to and unpacking by other channels via said interchannel link and for storing messages received from other channels via said interchannel link in said link RAM.

4,625,308

ALL DIGITAL IDMA DYNAMIC CHANNEL ALLOCATED SATELLITE COMMUNICATIONS SYSTEM AND METHOD

Kap S. Kim, Gaithersburg; William R. H. Tisdale, Baltimore; Bruce S. Andrews; T. Randolph Nash, both of Rockville; Kathleen J. Kolodgie, and Steven S. Eiserike, both of Rockville, all of Md., assignors to American Satellite Company, Rockville, Md.

Filed Nov. 30, 1982, Ser. No. 445,501
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—104 66 Claims



1. A communication system, comprising:
(a) transmission means for transmitting a radio frequency signal in accordance with a first IF signal, and for providing a second IF signal in accordance with a received radio frequency signal;
(b) time division multiple access means for generating said first IF signal by assembling frames of first serial data, and for providing second serial data by disassembling said second IF signal;
(c) switch multiplexer means for supplying said first serial data from stored first parallel data under control of first control signals, and for providing second parallel data from said second serial data under control of second control signals;
(d) bus extension means for providing said stored first parallel data by storing first parallel data, and for providing stored second parallel data by storing said second parallel data;
(e) digital input/output means for supplying said first parallel data in accordance with first digital data, and for supplying second digital data in accordance with said stored second parallel data;
(f) conversion means for providing said first digital data in accordance with first analog signals, and for providing second analog signals in accordance with said second digital data; and
(g) control means for providing said first and second control signals in accordance with input signals and a stored program.

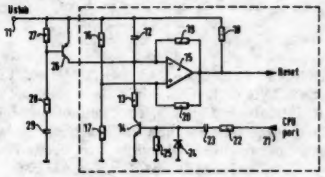
4,625,309

MONITORING CIRCUIT WITH POWER-UP INTERVAL SAFEGUARD FOR A MICROCOMPUTER

Werner Nitschke, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,499
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240706
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—12 8 Claims

1. Electric circuit apparatus for monitoring an electronic computer component which provides periodic signals at one of its outputs during normal operation, including a capacitor connected to a charge/discharge circuit controllable by said periodic signals and connected also to a comparator in such a manner that when the charge of said capacitor reaches a predetermined voltage value, said comparator provides a reset signal for said computer component, said apparatus including the improvement which comprises:
circuit means (26,33) for maintaining said very same capacitor (12) at a condition of charge which corresponds to the provision of a reset signal at the output of said comparator



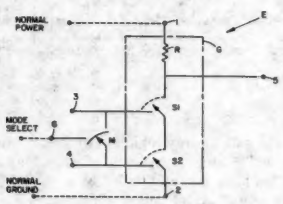
(15), regardless of any signal at said output of said computer component, during a period beginning with the turning on of a supply voltage both for said apparatus and for said computer component and ending at a time dependent upon the value of said supply voltage and independent of said periodic signals.

4,625,310

UNIVERSALLY TESTABLE LOGIC ELEMENTS AND METHOD FOR STRUCTURAL TESTING OF LOGIC CIRCUITS FORMED OF SUCH LOGIC ELEMENTS

M. Ray Mercer, 3024 Thousand Oaks Dr., Austin, Tex. 78746

Filed Apr. 23, 1984, Ser. No. 602,830
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—15 33 Claims



1. A logic element for constructing logic circuits which allows the structural testing of such circuits with a minimal number of test patterns, comprising:
(a) a power input terminal for directing external power to the logic element;
(b) a ground terminal;
(c) gating means coupled between the power input terminal and ground terminal, wherein the gating means has:
(1) first bidirectional switch means;
(2) second bidirectional switch means;
(3) first data input means for applying data signals to the first bidirectional switch means;
(4) second data input means for applying data signals to the second bidirectional switch means;
(5) data output means for sensing signals generated by the gating means;
(6) wherein the first and second bidirectional switch means are configured so that the gating means is capable of generating a functionally complete logic function signal at the data output means in response to the signals applied to the first and second switch means through the first and second data input means;
(d) bidirectional mode switch means coupled between the data input means;

(e) a single mode input means for applying a mode signal to the mode switch means;

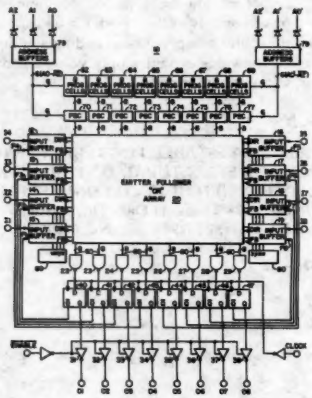
(f) wherein the element functions as an AND gate or OR gate in test modes, in response to signals applied to the mode input means, when current normally applied across the power and ground terminals is reversed, whereby all data input or data output stuck-at faults can be detected with only two data signal test patterns.

4,625,311

PROGRAMMABLE ARRAY LOGIC CIRCUIT WITH TESTING AND VERIFICATION CIRCUITRY

Mark E. Fitzpatrick; Cyrus Y. Tsui, both of San Jose; Andrew K. Chan, Milpitas, and Albert L. Chan, San Jose, all of Calif., assignors to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Jun. 18, 1984, Ser. No. 621,536
Int. Cl.[4] G01R *15/12*
U.S. Cl. 371—15 **7 Claims**



1. A programmable array logic circuit comprising:

a programmable logic array matrix comprising a first programmable logic array followed by a second logic array;

said matrix including a plurality of input lines and a plurality of output lines;

means for sensing each of the output lines of said logic array matrix to determine the logical state thereof during the operation of the programmed logic circuit;

means for allowing a test signal at selected input lines to pass through said programmed logic array matrix; and

vertification means for utilizing the same sensing means to sense the effect and speed of the test signals to verify if the logic array has been correctly programmed.

4,625,312

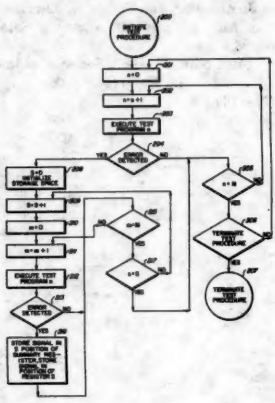
TEST AND MAINTENANCE METHOD AND APPARATUS FOR INVESTIGATION OF INTERMITTENT FAULTS IN A DATA PROCESSING SYSTEM

Lawrence D. Bashaw, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Continuation of Ser. No. 539,358, Oct. 6, 1983, abandoned. This application Feb. 18, 1986, Ser. No. 830,903
Int. Cl.[4] G06F *11/04*
U.S. Cl. 371—16 **4 Claims**

1. The method of investigating an intermittent fault in a data processing system having a plurality of component assemblies, said system including a maintenance processor for executing a plurality of test programs, each test program testing a given component assembly of the data processing system to detect the presence of a fault in the component so tested and for identifying the fault detected; said method comprising the steps of:

a. executing the test programs sequentially until a given test program identifies that a fault is detected in a given component assembly;



b. re-executing the test program which detected the fault in the given component assembly "T" times where "T" is an integer greater than zero;

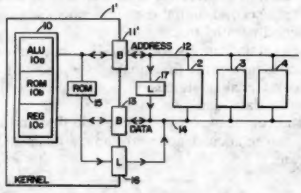
c. storing at the completion of each of the "T" re-executions of the test program of step b, each fault detected during each such re-execution of the program as a function of time.

4,625,313

METHOD AND APPARATUS FOR TESTING ELECTRONIC EQUIPMENT

Richard A. Springer, Tualatin, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 6, 1984, Ser. No. 628,191
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—20 **8 Claims**



1. Digital apparatus comprising:

a microprocessor;

a first address bus portion connected to said microprocessor;

a first data bus portion connected to said microprocessor;

digital memory connected between said first address bus portion and said first data bus portion;

a second address bus portion;

address buffer means which connect said first address bus portion to said second address bus portion, so as to isolate electrically said first address bus portion from said second address bus portion, but permitting the transfer of electrical signals at least from said first address bus portion to said second address bus portion;

a second data bus portion;

data buffer means which connect said first data bus portion to said second data bus portion, so as to isolate electrically

said first data bus portion, but permitting the transfer of electrical signals both from said first data bus portion to said second data bus portion, and from said second data bus portion to said first data bus portion; and

data latch means which connect from said first data bus portion to said second data bus portion, so as to isolate electrically said first data bus portion from said second data bus portion, but permitting the capture by said data latch means of electrical signals at least from said first data bus portion and the application of captured electrical signals to said second data bus portion.

4,625,314

METHOD FOR THE RECOGNITION OF THE OUTAGE OF ONE OR MORE TRANSMISSION CHANNELS IN A REDUNDANTLY DESIGNED OPTICAL TRANSMISSION SYSTEM

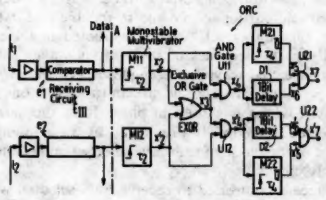
Hans-Hermann Witte, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,548

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3335156

Int. Cl.⁴ G06F *11/16*

U.S. Cl. 371—68 **8 Claims**



1. An outage recognition device for a redundantly designed optical transmission system having at least two receiver circuits at each station of the system and each receiver circuit having an input and an output with the input being connected to a separate transmission channel, said device determining an outage in each channel and comprising a separate first means connected through the output of each receiver circuit of the receiver circuits for creating an output signal for a first time constant for each bit of data received from the receiver circuit, second means for receiving the output signals from two of the first means and creating a positive signal only when one of the output signals is being received, a pair of first AND gates with one AND gate receiving the output signals from both the second means and the first means of one channel and the other AND gate receiving the output signals of both the second means and the first means of the other channel, each of the first AND gates having its output connected to both a separate third means and to a separate delay means, the delay means for each of the first AND gates delaying the signal of the AND gate by a specific time duration and applying it to one of a pair of second AND gates and the third means for the same first AND gate having an output connected to the same second AND gate, said third means creating a zero signal for a second time constant for each signal received from the first AND gate and then applying a positive signal so that the output of the second AND gates are zero when both channels are without failure and when a channel fails, the second AND gate of the other channel will have a pulse signal.

4,625,315

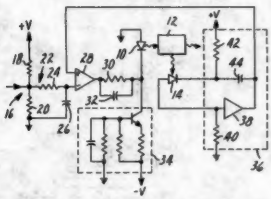
APPARATUS AND CIRCUITRY FOR STABILIZING LASER DIODE OUTPUT FOR ANALOG MODULATION

Richard R. Lemberger; Paul C. Schubert, and Steven R. Tobin, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 27, 1984, Ser. No. 644,873

Int. Cl.⁴ H01S *3/00*

U.S. Cl. 372—38 **6 Claims**



1. Circuitry and apparatus for stabilizing the output of a laser diode allowing the laser diode to be modulated by a wideband analog signal including:

a laser diode;

means operatively arranged for receiving the analog signal for modulating the output of said laser diode, said means including a high gain amplifier having two inputs, one input operatively connected for receiving the signal for modulating said laser diode, the other input for receiving a feedback signal;

a compensating network connecting the output of said high gain amplifier to said laser diode;

a feedback circuit connected to provide a feedback voltage signal to said other input of said high gain amplifier, said feedback circuit including a pin diode;

means for optically coupling said pin diode to the laser diode for providing a portion of the light output from said laser diode to said pin diode.

4,625,316

HIGH EFFICIENCY ELECTRON BEAM GUN FOIL SUPPORT

James P. O'Loughlin, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 17, 1984, Ser. No. 661,549

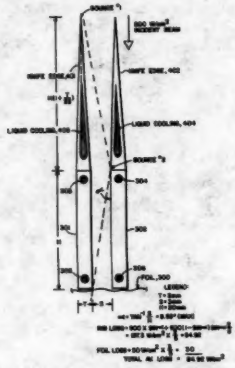
Int. Cl.⁴ H01S *3/09*

U.S. Cl. 372—74 **9 Claims**

1. In combination with a laser having an electron gun with a cathode emitting a beam of electrons which pass through at a foil into a chamber, an electron beam gun foil support comprising:

a plurality of ribs of rectangular cross sections, each having a top end facing said beam of electrons and a lower end supporting said foil; and

a plurality of fins of triangular cross sections, each capping the top end of a rectangular rib, each of said triangular ribs



being oriented to reduce all grazing angles of said electrons on said rectangular rib.

4,625,317

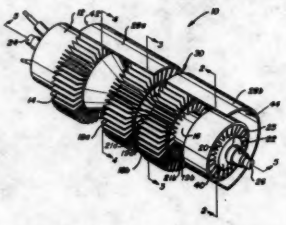
INTERNAL MIRROR LASER

William P. Kolb, Redwood City, and Dale E. Crane, Sunnyvale, both of Calif., assignors to Cyonics, Ltd., Sunnyvale, Calif.

Filed Apr. 12, 1984, Ser. No. 599,298

Int. Cl.[4] H01S 3/097

U.S. Cl. 372—88 **8 Claims**



1. An internal mirror gas laser having a capillary tube and an anode housing coaxial with a central axis, and having mirrors sealably mounted to each end of said laser, said mirrors being in alignment about said central axis, said laser further comprising:

a cathode housing forming a supporting wall coaxial with said central axis, said cathode housing being constructed primarily of a material with a figure of merit (defined as the quotient of thermal conductivity divided by thermal expansion) greater than 0.3×10^6 watts per inch, one of said mirrors being sealably mounted to said cathode housing, said figure of merit being sufficient to ensure that said cathode housing provides a combination of thermal stability and uniform heat dissipation which is adequate to prevent misalignment of said mirrors under conditions of convective cooling; and

means for convectively cooling said cathode housing, said anode housing and said capillary tube with minimal thermal assymmetry relative to said central axis.

4,625,318

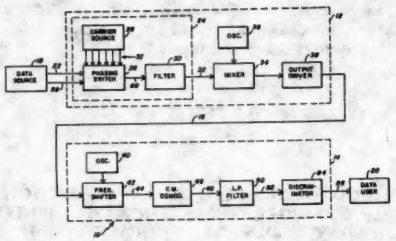
FREQUENCY MODULATED MESSAGE TRANSMISSION

Robert J. Snyder, Westford, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Feb. 21, 1985, Ser. No. 703,798

Int. Cl.[4] H04L 27/12

U.S. Cl. 375—46 **4 Claims**



4. Encoding apparatus for encoding a stream of data having discrete signals occurring at a predetermined rate B, as a corresponding frequency modulated wave, comprising

a carrier source simultaneously generating n sinusoidal carrier waves (where n is an integer at least equal to three) all of said carrier waves being of a predetermined frequency f, said n waves having relative phases phased around a cycle at uniform phase increments,

a phasing switch connected to receive the n carrier waves from said carrier source and to receive said data stream, said phasing switch being constructed to select sequentially particular ones of said carrier waves and to emit each selected wave for an interval 1/B, said switch being responsive to data in said stream to select a one of carrier waves which is shifted in phase from the carrier wave selected immediately previously by an amount independent of the phase of the wave selected immediately previously,

filter means connected to receive each selected wave from said phasing switch and constructed to emit, upon receiving a selected carrier wave of the same phase as that of the previously received carrier wave, a filter output wave which is of frequency f, and to emit upon receiving a selected carrier wave shifted in phase from the carrier wave last previously received, a filter output wave which deviates in frequency from f for a period 1/B.

4,625,319

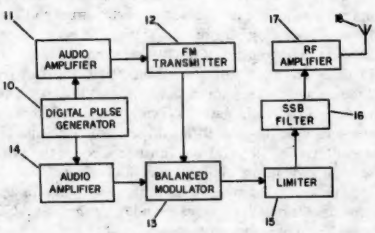
NARROW BAND, SSB, FM TRANSMITTER

Marc S. Krawitz, 3001 Chapel Hill Rd., Orange, Calif. 92667

Filed Sep. 10, 1984, Ser. No. 648,784

Int. Cl.[4] H03C 1/52

U.S. Cl. 375—61 **17 Claims**



1. A transmission system for single sideband, frequency modulated signals, comprising:

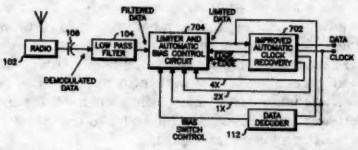
a. a frequency modulating signal means;
b. a balanced modulator connected to the output of the frequency modulating signal means;
c. an audio frequency digital signal source having a single discrete frequency for simultaneously actuating the balanced modulator and the frequency modulating signal means, the audio signal source being connected to the said modulator and to the frequency modulating signal means, the balanced modulator being adapted to turn on and conduct a signal from the frequency modulating signal means when the audio frequency digital signal source is turned on, and to turn off when the said audio source is turned off, thereby preventing transmission from the balanced modulator, the output from the balanced modulator being in the form of a frequency modulated signal with corresponding amplitude envelopes;
d. means for amplifying an audio signal from the said audio frequency digital signal source to the frequency modulating signal means and to the balanced modulator;
e. a limiter connected to the output of the balanced modulator for removing the amplitude modulated envelopes produced by the balanced modulator, and for passing the frequency modulated signal;
f. a bandpass filter connected to the limiter for selecting a single sideband portion of the frequency modulated signal for transmission; and,
g. amplifying and antenna means for broadcasting the single sideband frequency modulated signal.

4,625,320

AUTOMATIC BIAS CIRCUIT

James S. Butcher, Glendale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1985, Ser. No. 728,960
Int. Cl.[4] H04L *25/06*
U.S. Cl. 375—76 **18 Claims**



14. A method of biasing a data signal limiter of a synchronous data decoder to compensate baseline wander of the data signal with a bias level, comprising the steps of:
producing binary data levels and signals representing data level transition edges in response to the data signal and said bias level;
generating local clock signals;
detecting a time relationship between said level transition edge representative signals and at least one of said local clock signals; and
modifying the bias level in accordance with said detected time relationship, thereby causing said data level transition edges to be substantially synchronized with said local clock signals.

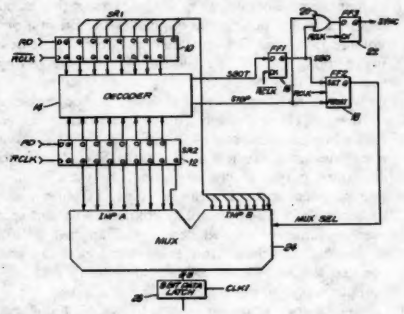
4,625,321

DUAL EDGE CLOCK ADDRESS MARK DETECTOR

Henry W. Pechar, Commack, and Tak P. Li, Nescomset, both of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed May 23, 1985, Ser. No. 737,060
Int. Cl.[4] H04K *1/02*
U.S. Cl. 375—116 **1 Claim**

1. An address mark detector comprising an input for receiving a reference clock and an input data stream from an external data source in which the data stream includes an embedded clock in a multi-bit combined data and missing clock pattern, said address mark detector comprising first and second shift registers each having a bit capacity less than the number of bits of said multi-bit pattern, said first and second shift registers comprising means for respectively sampling the incoming data in response to alternate phases of the reference clock and means coupled to the outputs of said first and second shift



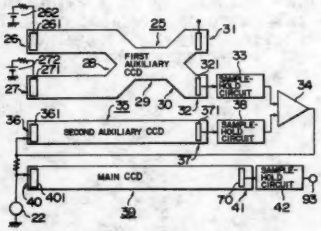
registers for detecting in which one of said first and second registers the missing clock pattern is contained and for producing a detect signal at the output of that shift register; data storing means, and logic means responsive to said detect signal for passing data from the other of said shift registers to said data storing means.

4,625,322

CHARGE COUPLED DEVICE PROVIDED WITH AUTOMATIC BIAS-VOLTAGE SETTING MEANS

Hisanobu Tukazaki, Yokohama; Kazuo Kondo, and Syuzo Matsumoto, both of Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,369
Claims priority, application Japan, Nov. 18, 1983, 58-216241; Dec. 5, 1983, 58-228421
Int. Cl.[4] H01L *29/76*
U.S. Cl. 377—58 **6 Claims**



1. A bias voltage setting circuit for a main charge coupled device, said main charge coupled device including a first input electrode, a plurality of gate electrodes and a first output electrode, all of said first input electrode, gate electrodes and first output electrode being formed on a single semiconductor substrate, said first input electrode being applied with an A.C. signal and a first D.C. bias voltage, each of said gate electrodes being applied with a pulse voltage, an electric charge not more than Q_{MAX} being transferred from said first input electrode to said first output electrode through a channel formed under said gate electrodes, said first output electrode generating a signal voltage corresponding to the transferred electric charge, said bias voltage setting circuit comprising:
(a) a first auxiliary charge coupled device including a second input electrode and a second output electrode each

formed on said semiconductor substrate, said second input electrode being applied with a second D.C. bias voltage, an electric charge equal to Q_{MAX}/n being detected by said second output electrode, where n is greater than one, said first auxiliary charge coupled device generating a first output voltage corresponding to said electric charge equal to Q_{MAX}/n;

(b) a first sample-hold circuit connected to said first auxiliary charge coupled device and applied with said first output voltage from said first auxiliary charge coupled device, for sampling and holding said first output voltage to generate a D.C. voltage V_N;

(c) a second auxiliary charge coupled device including a third input electrode and a third output electrode each formed on said semiconductor substrate, said third input electrode being applied with a third D.C. bias voltage, said third output electrode generating a second output voltage in accordance with said third D.C. bias voltage;

(d) a second sample-hold circuit connected to said second auxiliary charge coupled device and applied with said second output voltage from said second auxiliary charge coupled device, for sampling and holding said second output voltage to generate a D.C. voltage V_X;

(e) a comparison circuit connected to said first and second sample-hold circuits and applied with said D.C. voltage V_N from said first sample-hold circuit and said D.C. voltage V_X from said second sample-hold circuit, for comparing said D.C. voltage V_X with said D.C. voltage V_N to generate a detection signal when said D.C. voltage V_X is different from said D.C. voltage V_N, said detection signal being supplied to said second auxiliary charge coupled device, to vary said third D.C. bias voltage so that said D.C. voltage V_X becomes substantially equal to said D.C. voltage V_N; and

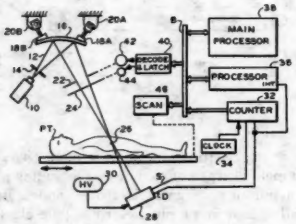
(f) bias-voltage supply means connected between said third input electrode of said second auxiliary charge coupled device and said first input electrode of said main charge coupled device for supplying said third D.C. bias voltage of said third input electrode to said main charge couple device to use said third D.C. bias voltage as said first D.C. bias voltage of said first input electrode.

4,625,323

EQUIPMENT FOR SPECTRAL RADIOLOGY

Yoshiharu Okaya, 4 Wels La., East Setauket, N.Y. 11733

Filed Sep. 19, 1983, Ser. No. 533,113
Int. Cl.[4] G03B *41/16*
U.S. Cl. 378—82 **28 Claims**



10. A medical diagnostic method for radiologically examining a living patient for a predetermined spectral feature indicative of predetermined absorption edges of target atoms in said living patient, with a reflective monochromator having a bent, radiation reflective crystal and with a source of radiation for producing x-rays at an energy range suitable for medical diagnostics and having a spectrum suitable for producing images of the inside of said patient, comprising the steps of:

directing said source of radiation at said monocromator;

supporting said living patient at a position to intercept x-rays reflected from said monochromator;

angularly positioning said monochromator to reflectively focus at a point in said living patient a narrowed bandwidth of said radiation with a wavelength continuously, spatially and angularly variable over a bandwidth embracing said predetermined spectral feature; and

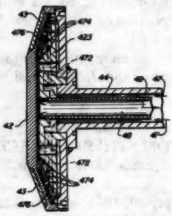
measuring on that side of said patient opposite said monochromator the extent of radiation passing through said patient at a position where the specturm of said radiation is spatially distributed.

4,625,324

HIGH VACUUM ROTATING ANODE X-RAY TUBE

Edward A. Blaskis, Hudson, and Roland W. Carlson, Lyndhurst, both of Ohio, assignors to Technicare Corporation, Solon, Ohio

Continuation-in-part of Ser. No. 533,706, Sep. 19, 1983. This application Feb. 10, 1984, Ser. No. 579,068
Int. Cl.[4] H01J *35/10*
U.S. Cl. 378—130 **5 Claims**



1. In a rotating anode x-ray tube having a liquid cooled anode assembly for rotation about an axis therethrough, said anode assembly having a generally disc shaped rotor including an annular target region on one face of said rotor and centered on said axis, and a rotatable shaft along said axis and extending outwardly from the face of said rotor opposite said one face, said shaft defining inflow and outflow channels for respective delivery and removal of coolant liquid to the interior of said rotor, the improvement comprising:

(a) a first plurality of channels within said rotor, each communicating with said inflow channel and extending radially outwardly to an annular recess within said rotor and generally of like radius with said annular target;

(b) a second plurality of radial channels disposed within said rotor and interiorly adjacent said annular target for heat exchange therewith, said second plurality of radial channels communicating with said outflow channel, each carrying material for inducing fluid turbulence; and

(c) plural jet nozzle means, each being in aligned correspondence with one of said second plurality of channels, for spraying fluid from said annular reces to an associated one of said second plurality of radial channels.

4,625,325

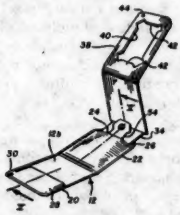
X-RAY FILM PACKAGE FOR DENTAL USE

Riccardo Beraudo, Millesimo/Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 26, 1984, Ser. No. 686,193
Int. Cl.[4] G03B *42/02*
U.S. Cl. 378—168 **28 Claims**

1. X-ray film package for dental use comprising a flexible, flat and light-impermeable, x-ray penetrable container (12) housing an X-ray film (14) and an intensifying screen (46), characterized in that said container (12) is provided with an orifice (24) that can receive said intensifying screen (46), said package characterized in that the container (12) has the shape of a prolongated envelope having a first portion (20) receiving

the X-ray film (14) and the above mentioned intensifying screen (46), and a second portion (22) communicating at one end thereof with the first portion (20) and being opened at the opposite end (24) for introducing and taking out the said intensifying screen (46), the container (12) being provided with protecting means (32, 62, 64, 66, 68, 72, 74, 76, 78, 80, 82, 100) to protect the X-ray film (14) against light penetration through said opened end (24).



4,625,326
APPARATUS FOR GENERATING A PSEUDO-STEREO SIGNAL

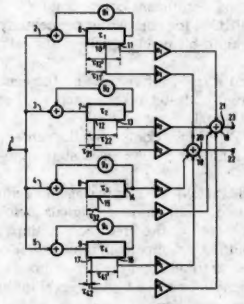
Wilhelmus J. W. Kitzen, and Mathias H. Geelen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 5, 1984, Ser. No. 668,445

Claims priority, application Netherlands, Nov. 17, 1983, 8303945

Int. Cl.⁴ H04R *5/00*

U.S. Cl. 381—17 **6 Claims**



1. An apparatus for generating a pseudo-stereo signal, which apparatus comprises:

an input terminal for receiving a mono signal,

at least two signal channels, each comprising a delay line, coupled to the input terminal, each delay line having an input and an output, the output being fed back to the input, and

a first and a second signal-combination unit, each having an output, which outputs are coupled to a first and a second output terminal respectively, for supplying a first and a second output signal,

characterized in that the delay lines are each provided with first and second taps, the first tappings of the delay lines are coupled to an input of the first signal-combination unit, the second taps of the delay lines are coupled to an input of the second signal-combination unit, and the first tap of each of at least two of said delay lines not coinciding with the second tap thereof.

4,625,327
SPEECH ANALYSIS SYSTEM

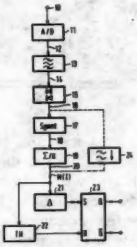
Robert J. Sluijter, and Hendrik J. Kotmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1983, Ser. No. 487,390

Claims priority, application European Pat. Off., Apr. 27, 1982, 82200500.5

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—49 **2 Claims**



1. In a speech analysis system comprising means for receiving an input analog speech signal and means for determining at regularly recurring instants the mean value of the rectified speech signal in segments thereof preceeding said instants, the mean values thus determined providing a measure for separating voiced speech segments from unvoiced speech segments, the provision of a bistable indicator settable to indicate a period of voiced speech and resettable to indicate a period of unvoiced speech or the absence of speech, and programmable computing means programmed to carry out the process including the steps of:

determining for each segment (number I) the mean value (M(I)) of the rectified speech signal of the relevant segment in a low frequency band of about 200-800 hz,

determining, if said indicator is set, for each segment and a number of preceding segments the maximum value (VM(I)) of the mean values M(n), with n=I, I−1, . . . I+1−m, in which m is such that between segments I and I+1−m there is no change in the state of the indicator,

determining for each segment an adaptive threshold (AT(I)) by setting AT(I) equal to a fraction of the maximum value VM(I) if said indicator is set and by setting AT(I) equal to a fraction of AT(I−1) if said indicator is reset,

setting the bistable indicator if the mean values M(n) with n=I, I−1, . . . I+1−k, wherein k is a predetermined number, increase monotonically for increasing values of n, by more than a given factor and M(I) exceeds the adaptive threshold AT(I−1),

resetting the bistable indicator if the mean value M(I) is smaller than a given fraction of the maximum value VM(I−1) or is smaller than a predetermined threshold.

4,625,328
INTEGRATED AMPLIFIER AND SPEAKER SYSTEM WITH IMPROVED COOLING EFFICIENCY

Tommyca Freadman, Taipei, Taiwan, assignor to Konutra Industries, Ltd., Taipei, Taiwan

Continuation-in-part of Ser. No. 503,830, Jun. 13, 1983. This application Apr. 9, 1984, Ser. No. 598,437

Int. Cl.⁴ H04R *3/00*

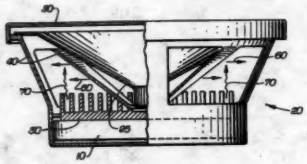
U.S. Cl. 381—111 **10 Claims**

1. An integrated amplifier and speaker system comprising:

a speaker diaphragm; and

a power amplifier disposed adjacent to the speaker diaphragm so that air waves produced by excursion of the speaker diaphragm are directed toward the amplifier, the power amplifier operationally connected to drive the

speaker diaphragm, the power amplifier having one or more power transistors having a specified maximum operating temperature level, said power amplifier including a heat sink conductively connected to the power transistors, wherein the heat sink in the absence of circulating air is



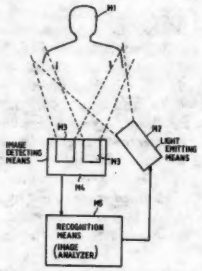
insufficient to maintain the temperature of the power transistors below the specified maximum temperature level and wherein use of the heat sink member together with the air waves produced by the speaker diaphragm maintains the temperature of the power transistors at or below the specified maximum temperature level.

4,625,329

POSITION ANALYZER FOR VEHICLE DRIVERS

Hiroshi Ishikawa, Nagoya; Kazuma Matsui, Toyohashi; Takashi Kurahashi, Aichi; Hidehiko Akatsuka, and Motokazu Yamada, both of Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 18, 1985, Ser. No. 692,545
Claims priority, application Japan, Jan. 20, 1984, 59-9344
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—1 **14 Claims**



1. A position analyzer for a vehicle driver, comprising:
light emitting means for directing light to said driver's face;
light detecting means comprising a pair of two-dimensional image sensors for detecting light reflected from said driver's face; and
recognition means for determining the position of said driver in a three-dimensional coordinate system in response to optical images detected by said image sensors.

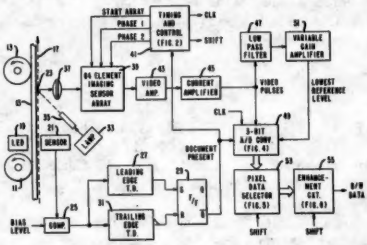
4,625,330

VIDEO ENHANCEMENT SYSTEM

Raymond L. Higgins, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 19, 1983, Ser. No. 562,787
Int. Cl.[4] G06K *9/40*
U.S. Cl. 382—27 **5 Claims**

1. In an optical character reader including a video camera for optically scanning a character on a document to develop successive scans of analog pixel signals representative of the character image being scanned, a video enhancement system comprising:
means for converting each analog pixel signal into a multi-bit pixel signal having an associated one of a plurality of levels of quantization;
means for storing scans of multi-bit pixel signals to form a preselected configuration of multi-bit pixel signals including a multi-bit center pixel signal;
first means for comparing said center pixel with each of a plurality of subregions of multi-bit pixel signals in said preselected configuration to develop a plurality of comparison codes;
second means for selectively comparing said comparison codes to develop a plurality of second codes; and
third means for comparing said second codes to determine whether said center pixel signal should be a first value or a second value;
said plurality of subregions of multi-bit pixel signals comprising the respective two multi-bit pixel signals to the left of, to the right of, above and below the center pixel signal; and said first means comprising:



a first PROM for comparing the center pixel signal with the two multi-bit pixel signals to the left of the center pixel signal;
a second PROM for comparing the center pixel signal with the two multi-bit pixel signals to the right of the center pixel signal;
a third PROM for comparing the center pixel signal with the two multi-bit pixel signals above the center pixel signal; and
a fourth PROM for comparing the center pixel signal with the two multi-bit pixel signals below the center pixel signal, each of the first, second, third and fourth PROMs outputting a comparison code as a function of its determination as to whether the center pixel signal is possibly one of the two or three highest level multi-bit pixel signals of a character segment.

4,625,331

AUTOMATIC FREQUENCY CONTROL SYSTEM OR AN SSB RECEIVER

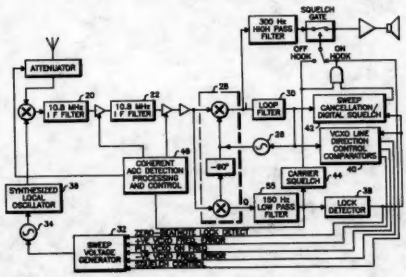
Julian H. Richardson, Clevedon, England, and Bruce C. Eastmond, Downers Grove, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 17, 1984, Ser. No. 618,609
Int. Cl.[4] H04B *7/00, 1/68;* H03J *7/22*
U.S. Cl. 455—35 **24 Claims**

9. An automatic frequency control circuit for a single sideband radio receiver having a local oscillator, mixer, and IF bandpass and which receives a signal transmitted by a transmitter and detects squelch information in the transmitted signal comprising:
means for varying the local oscillator frequency of the radio receiver;
means, responsive to the local oscillator frequency, for acquiring the transmitted signal and indicating a direction in which the local oscillator frequency should be varied to

essentially center the transmitted signal in the radio receiver IF bandpass;

means, coupled to said means for acquiring, for commencing detection of squelch information from the transmitted



signal when the signal is acquired and for removing said local oscillator frequency variation from the squelch information; and

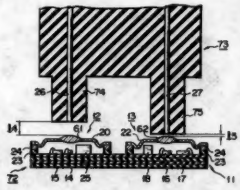
means for deactivating said local oscillator frequency varying means in response to said squelch detection.

4,625,332

PROGRAMMABLE TIME VARYING ATTENUATOR

Paul A. Singer, Santee, and James L. Conrath, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1985, Ser. No. 718,259
Int. Cl.⁴ H04B *17/00*
U.S. Cl. 455—67 **3 Claims**



1. An apparatus for injecting an automatic time varying attenuated test signal mixed in with an information signal from an information source that is fed to a radio receiver comprising:

means for providing a simulated radio signal of constant amplitude;

means for generating digital programmable time varying attenuation control signals including an EPROM and operatively associated counter that provide programmable digital signals;

means coupled to the constant amplitude simulated radio signal providing means and the digital programmable time varying attenuating control signal generating means for attenuating the constant amplitude simulated radio signal with digital programmable time varying attenuating control signals to provide the automatic varying attenuated test signal; and

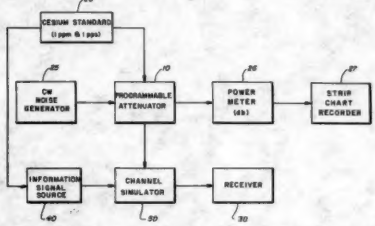
a clock source coupled to the information source and to the digital programmable time varying attenuation control signal generating means to provide common timing control thereof, the digital programmable time varying attenuation control signal generating means includes a memory address circuit coupled to the EPROM and a latch circuit coupled to receive an outputted programmable digital sequence from the EPROM, the clock source being operatively coupled to the counter, and the counter being operatively coupled to the EPROM, the memory address circuit and the latch circuit to assure a desired time relationship thereof with the information signal.

4,625,333

DUPLEX OPTICAL COMMUNICATION DEVICE

Hatsuo Takezawa, Yokohama, and Satoshi Takebe, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 545,007, Oct. 24, 1983, abandoned.
This application Jul. 18, 1985, Ser. No. 755,980
Claims priority, application Japan, Oct. 26, 1982, 57-186688
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 455—612 **10 Claims**



1. A duplex optical communication device comprising:

a transmission module unit having a light emitting element and a lens confronting a light emitting surface of said light emitting element;

a reception module unit having a light receiving element and a lens confronting a light receiving surface of said light receiving element;

connector means for holding said transmission module and reception module unit; and

a connector structure arranged so as to be fitted into said connector means and provided with transmission and reception optical fibers,

an end face of said transmission optical fiber confronting said light emitting element and being positioned a first finite distance from said transmission module unit lens at an imaging point thereof, and on which is formed an image the magnification of which is set to provide substantially the maximum possible light-coupling efficiency to the transmission module unit, and said transmission module unit lens is between said light emitting element and said transmission optical fiber and

an end face of the reception optical fiber confronting said light receiving element and being positioned a second finite distance from said reception module unit lens by a distance substantially equal to or less than the focal length of said reception module unit lens, said reception module unit lens being located between said light receiving element and said reception optical fiber, and wherein said first finite distance is longer than said second finite distance.

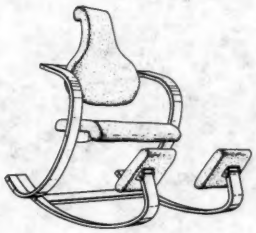
DESIGNS

NOVEMBER 25, 1986

286,820
SPORTS SHOE
Wan C. Lu, Fl. 10, No. 50, Sung Chian Rd., Taipei, Taiwan
Filed Aug. 8, 1984, Ser. No. 638,703
Term of patent 14 years
U.S. Cl. D2—310

286,821
SHOE SOLE
David A. Canon, Claremont, N.H.; Arthur W. Bowen, Jr., Quechee, and James H. Lucarelli, Brownsville, both of Vt., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 5, 1984, Ser. No. 668,068
Term of patent 14 years
U.S. Cl. D2—320

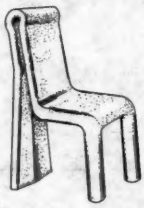
286,822
COMBINED ROCKING CHAIR AND KNEELER
Peter Opsvik, Högtunveien 12, 1370 Asker, Norway
Filed Apr. 27, 1984, Ser. No. 604,837
Term of patent 14 years
U.S. Cl. D6—335



286,823
CHILD'S ROCKING CHAIR
Dawn C. Roser, 604 E. Hillcrest Rd., York, Pa. 17403
Filed Jun. 4, 1984, Ser. No. 617,315
Term of patent 14 years
U.S. Cl. D6—345

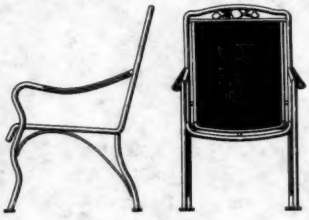
286,824
ROCKING CHAIR
Peter Opsvik, Högtunveien 12, 1370 Asker, Norway
Filed Apr. 27, 1984, Ser. No. 604,836
Term of patent 14 years
U.S. Cl. D6—348

286,825
CHAIR
Roger Rougier, 105 De Louvain West, Montreal, Province of Quebec, Canada H2N 1A3
Filed Apr. 16, 1984, Ser. No. 600,517
Term of patent 14 years
U.S. Cl. D6—363

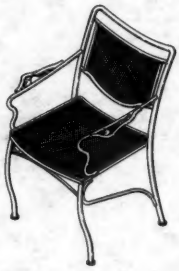


286,826
CHAIR FRAME ASSEMBLY
Donald B. Colby, Sarasota, Fla., assignor to Lee L. Woodard Inc., Owosso, Mich.
Filed May 11, 1984, Ser. No. 609,436
Term of patent 14 years
U.S. Cl. D6—379

286,827
CHAIR
James R. Arthur, Jr., Birmingham, Ala., assignor to Meadowcraft, Inc., Birmingham, Ala.
Filed May 8, 1984, Ser. No. 608,107
Term of patent 14 years
U.S. Cl. D6—376

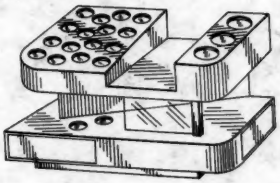


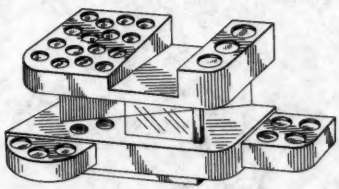
286,828
CHAIR
James R. Arthur, Jr., Birmingham, Ala., assignor to Meadowcraft Inc., Birmingham, Ala.
Filed May 8, 1984, Ser. No. 608,109
Term of patent 14 years
U.S. Cl. D6—376



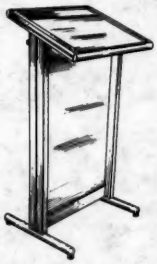
286,829
DISPLAY STAND
Karl Yeranossian, Pearl River, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Oct. 3, 1983, Ser. No. 538,408
Term of patent 14 years
U.S. Cl. D6—396

286,830
FLOWER DISPLAY STAND
Jon L. Stern, 150 S. Spalding Dr., Beverly Hills, Calif. 90212; Thomas N. Linton, 10401 Wilshire Blvd., Los Angeles, Calif. 90024, and Paul S. Rosen, Los Angeles, Calif., assignors to Florescence, Inc., Beverly Hills, Calif., by said Paul S. Rosen
Filed Mar. 5, 1984, Ser. No. 586,004
Term of patent 14 years
U.S. Cl. D6—405

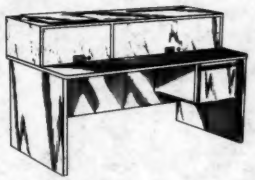


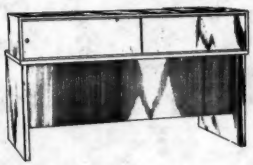


286,831
LECTERN
John Matyear, Kalorama, Australia, assignor to Lectrum Pty. Ltd., Victoria, Australia
Filed Mar. 5, 1984, Ser. No. 586,133
Term of patent 14 years
U.S. Cl. D6—419

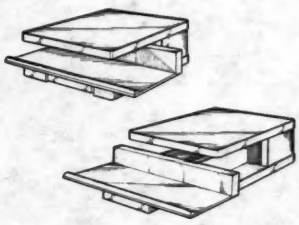


286,832
COMBINED COMPUTER WORK STATION AND STORAGE UNIT
Stephen N. Matthews, P.O. Box 8, Larkspur, Colo. 80118; Alan D. Milner, 1150 S. Vrain, Denver, Colo. 80219, and David G. Milner, 1365 S. Bryant, Denver, Colo. 80223
Filed May 11, 1984, Ser. No. 609,486
Term of patent 14 years
U.S. Cl. D6—425

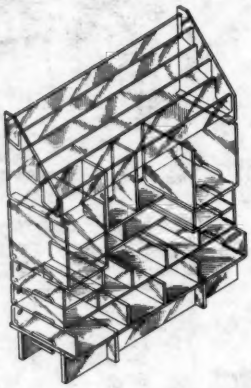




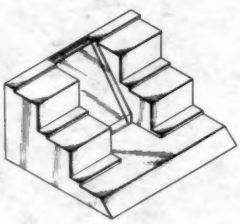
286,833
CONSOLE FOR VIDEO DISPLAY UNIT WITH EXTENDABLE KEYBOARD SUPPORT
Paul M. Cervero, 27361 Delton, Madison Heights, Mich. 48071
Filed May 21, 1984, Ser. No. 612,198
Term of patent 14 years
U.S. Cl. D6—429



286,834
MODULAR STORAGE AND DISPLAY UNIT
Roger B. Wilken, Guilford, Vt., assignor to Clear Solutions, Inc., W. Brattleboro, Vt.
Filed May 18, 1984, Ser. No. 611,771
Term of patent 14 years
U.S. Cl. D6—473

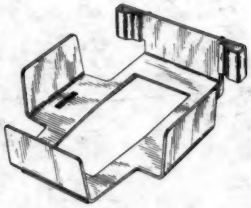


286,835
WATCH DISPLAY STAND
Charlotte Marsh, Irvine, Calif., assignor to Innovative Time Corporation, Carlsbad, Calif.
Filed Aug. 23, 1984, Ser. No. 643,485
Term of patent 14 years
U.S. Cl. D6—474



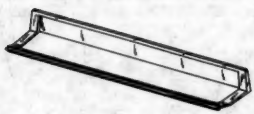
286,836
TABLE
Valeska Ginouves, 1142 Farmington Ave., West Hartford, Conn. 06107
Filed Feb. 15, 1984, Ser. No. 580,374
Term of patent 14 years
U.S. Cl. D6—484

286,837
MAGAZINE VENDING TRAY
Walter Nathan, Glencoe, Ill., assignor to RTC Industries, Inc., Chicago, Ill.
Filed Aug. 1, 1983, Ser. No. 519,108
Term of patent 14 years
U.S. Cl. D6—510



286,838
ADJUSTABLE SHOWER HEAD HOLDER
Peter A. Katzler, and Fritzie M. Katzler, both of 5245 Birdeye Rd., Helena, Mont. 59601
Filed Sep. 26, 1984, Ser. No. 654,749
Term of patent 14 years
U.S. Cl. D6—524

286,839
TOWEL BAR
Martin P. Belokin, Denton, Tex., assignor to Martin Paul, Inc., Denton, Tex.
Filed Oct. 1, 1984, Ser. No. 656,250
Term of patent 14 years
U.S. Cl. D6—546



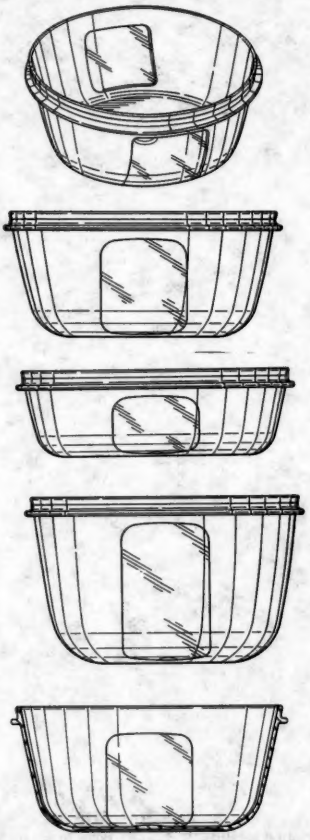
286,840
CORDIAL GOBLET
Alfred Blake, Hillsdale, N.J., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Nov. 2, 1984, Ser. No. 667,609
Term of patent 14 years
U.S. Cl. D7—13

286,841
WINE GOBLET
Alfred Blake, Hillsdale, N.J., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Nov. 2, 1984, Ser. No. 667,613
Term of patent 14 years
U.S. Cl. D7—13

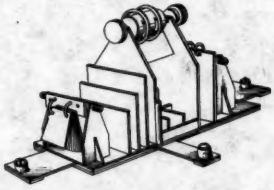
286,842
FOOTED TUMBLER
Alfred Blake, Hillsdale, N.J., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Nov. 2, 1984, Ser. No. 667,614
Term of patent 14 years
U.S. Cl. D7—13

286,843
PLATE OR SIMILAR ARTICLE
Helen Z. Shoreman, Washington, D.C., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Dec. 23, 1983, Ser. No. 564,898
Term of patent 14 years
U.S. Cl. D7—23

286,844
BOWL
Robert H. C. M. Daenen, Hekelgem, and Victor J. J. Cautereels, Zandhoven, both of Belgium, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 29, 1984, Ser. No. 594,595
The portion of the term of this patent subsequent to Nov. 18, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—23



286,845
COMBINED RESTAURANT CONDIMENT, CANDLE HOLDER AND ACCESSORY STAND
Lera M. Jones, 659 E. 11th St., Bowling Green, Ky. 42101
Filed Jan. 27, 1984, Ser. No. 574,625
Term of patent 14 years
U.S. Cl. D7—52



286,846

INSULATING JUG

Anso Zimmerman, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Anso Zimmerman, Niederaula, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 519,306

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, MR189

Term of patent 14 years

U.S. Cl. D7—77

286,847

INSULATING VESSEL

Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Anso Zimmerman, Niederaula, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 530,192

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, MR190

Term of patent 14 years

U.S. Cl. D7—77

286,848

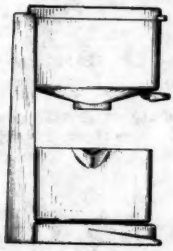
ELECTRIC HOT BEVERAGE MAKER

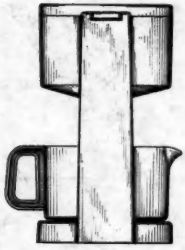
Monte L. Levin, New York, N.Y., assignor to Hamilton Beach Inc., Waterbury, Conn.

Filed Jul. 13, 1984, Ser. No. 630,753

Term of patent 14 years

U.S. Cl. D7—309





286,849

SUPPORT FOR MEAT OR THE LIKE

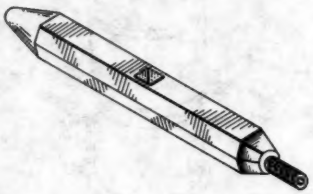
Norton Sarnoff, Northbrook, and Carl R. Fletcher, Arlington Heights, both of Ill., assignors to Ensar Corporation, Wheeling, Ill.

Filed Jan. 11, 1984, Ser. No. 569,973

Term of patent 14 years

U.S. Cl. D7—409

286,850
ADJUSTABLE SEAT WRENCH SOCKET
James Williams, 7124 Sandra, Houston, Tex. 77028
Filed Jul. 5, 1983, Ser. No. 510,516
Term of patent 14 years
U.S. Cl. D8—29

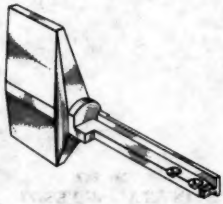


286,851
STAPLER
Toshikazu Suzuki, Tokyo, Japan, assignor to Plus Corporation, Tokyo, Japan
Filed Aug. 31, 1984, Ser. No. 646,119
Term of patent 14 years
U.S. Cl. D8—50

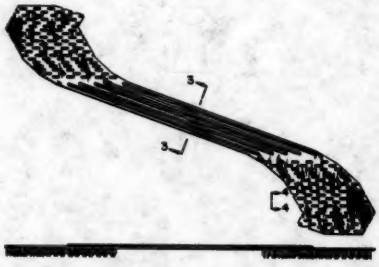
286,852
MOTORIZED ABRASIVE CUE TIP SHAPER
Robert C. Ditmanson, 3225 Northview Dr., Sacramento, Calif. 95833
Filed Aug. 20, 1984, Ser. No. 642,454
Term of patent 14 years
U.S. Cl. D8—90

286,853
PATTERN GLASS CUTTER
Conrad E. Johnson, 1163 Boylston St., Apt. #16, Boston, Mass. 02115
Continuation-in-part of Ser. No. 432,798, Dec. 23, 1982, abandoned. This application Jan. 31, 1985, Ser. No. 696,873
Term of patent 14 years
U.S. Cl. D8—98

286,854
KEY FOR DOOR LOCKS
William J. Fane, 2851 Trillium Pl., North Vancouver, British Columbia, Canada V7H IJ3, and Leonard J. Genest, 1061 Tropic La., Santa Ana, Calif. 92705
Filed May 14, 1984, Ser. No. 609,897
Term of patent 14 years
U.S. Cl. D8—347



286,855
CONNECTOR PLATE FOR TRUSSES OR THE LIKE
Buddy R. Paul, Fort Worth, Tex., assignor to Clary Corporation, Grand Prairie, Tex.
Filed Apr. 30, 1984, Ser. No. 605,117
Term of patent 14 years
U.S. Cl. D8—389

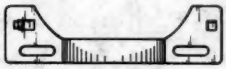


286,856
BOTTLE
Timothy Anscomb, Chailey, England, assignor to Schering - Prebbles Limited, Bootle, England
Filed Jan. 9, 1984, Ser. No. 569,003
Term of patent 14 years
U.S. Cl. D9—301

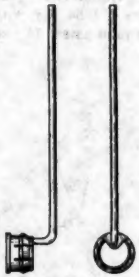
286,857
CONTAINER FOR LIQUIDS
Rao K. Murukurthy, 9311 Osceola Ave., Morton Grove, Ill.
Filed Aug. 4, 1983, Ser. No. 520,183
Term of patent 14 years
U.S. Cl. D9—352

286,858
BOTTLE FOR PERFUMES
Pomodoro Giorgio, Milan, Italy, assignor to Hanorah Italiana, Milan, Italy
Filed Jul. 13, 1983, Ser. No. 513,220
Claims priority, application Italy, Feb. 1, 1983, 20661 B/83
Term of patent 14 years
U.S. Cl. D9—370

286,859
CARRYING ATTACHMENT FOR A BOTTLE
Nai F. Wu, 4th Fl., No. 9, Lane 150, Sec. 2 Pao Fu Rd., Yuan Ho City, Taipei Hsien, Taiwan
Filed Nov. 4, 1983, Ser. No. 548,575
Claims priority, application Taiwan, Nov. 19, 1982, 7133733
Term of patent 14 years
U.S. Cl. D9—434



286,860
COMBINED POUR SPOUT AND AIR BLEEDER FOR FLUID CONTAINERS AND THE LIKE
John DiFede, 24878 Tioga Rd., Hayward, Calif. 94544
Filed May 30, 1984, Ser. No. 615,167
Term of patent 14 years
U.S. Cl. D9—435

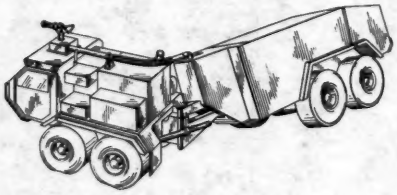


286,861
COMBINED LEVEL AND MEASURING DEVICE
Fred Hollinger, Kings Park, and Paul Ross, Pleasantville, both of N.Y., assignors to E & B Giftware, Mount Vernon, N.Y.
Filed Mar. 21, 1984, Ser. No. 591,691
Claims priority, application United Kingdom, Sep. 21, 1983, 1015230
Term of patent 14 years
U.S. Cl. D10—62

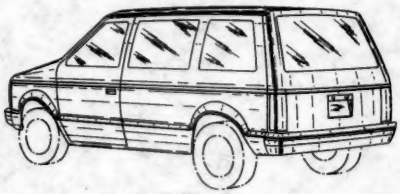
286,862
DISPLAY MOBILE FOR BALLOON OR SIMILAR ARTICLE
Sam P. Yu, No. 7, Ta Feng Rd., An Li Tsun, Shen Kang Hsiang, Tai Chung Hsien, Taiwan
Filed Jun. 25, 1984, Ser. No. 624,054
Term of patent 14 years
U.S. Cl. D11—141

286,863
GOLF TROPHY
Freddy T. Lee, 467 SE Whitmore Dr., Port St. Lucie, Fla. 33452
Filed May 4, 1984, Ser. No. 607,319
Term of patent 14 years
U.S. Cl. D11—160

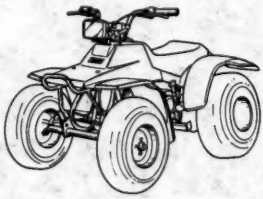
286,864
EMERGENCY VEHICLE
Daniel J. Lanzdorf, Pickett, and Richard C. Pollock, Oshkosh, both of Wis., assignors to Oshkosh Truck Corporation, Oshkosh, Wis.
Filed Jan. 25, 1984, Ser. No. 573,799
Term of patent 14 years
U.S. Cl. D12—13



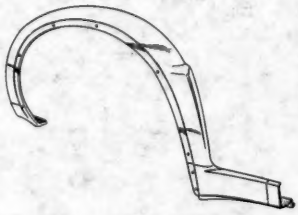
286,865
AUTOMOBILE BODY
William A. Dayton, Northville; John E. Crain, Birmingham, and Robert N. Hubbach, Clarkston, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Dec. 19, 1983, Ser. No. 562,809
Term of patent 14 years
U.S. Cl. D12—91



286,866
FOUR WHEELED MOTORCYCLE
Akio Makita, Tokyo; Yukinori Kawaguchi, Saitama, and Akira Watanabe, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1984, Ser. No. 613,509
Claims priority, application Japan, Nov. 24, 1983, 58-50962
Term of patent 14 years
U.S. Cl. D12—107

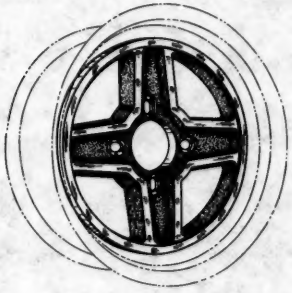


286,867
OUTER WHEEL HOUSING FOR AN AUTOMOBILE
Björn E. A. Envall, Vänersborg, and Dick O. Ohlsson, Trollhättan, both of Sweden, assignors to Saab-Scania Aktiebolag, Trollhättan, Sweden
Filed May 31, 1984, Ser. No. 615,769
Term of patent 14 years
U.S. Cl. D12—184



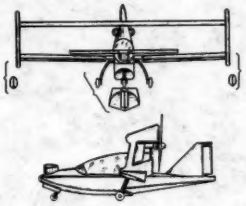
286,868
INNER WHEEL HOUSING FOR AN AUTOMOBILE
Björn E. A. Envall, Vänersborg, and Dick O. Ohlsson, Trollhättan, both of Sweden, assignors to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed May 31, 1984, Ser. No. 615,770
Term of patent 14 years
U.S. Cl. D12—184

286,869
VEHICLE WHEEL CENTER
Raymond J. Hedlund, Concord, Calif., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Oct. 29, 1981, Ser. No. 316,243
Term of patent 14 years
U.S. Cl. D12—211

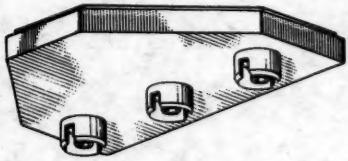


286,870
BOAT HULL
Richard Fairchild, 773 Kearny Way, Napa, Calif. 94558
Filed Mar. 6, 1984, Ser. No. 586,844
Term of patent 14 years
U.S. Cl. D12—302

286,871
CONVERTIBLE AMPHIBIOUS AIRPLANE
Kenneth L. Bunyard, 45 Olive Dr., Hialeah, Fla. 33010
Filed Nov. 19, 1984, Ser. No. 672,910
Term of patent 14 years
U.S. Cl. D12—324



286,872
BATTERY VENT CAP
David B. Beidler, Gilbertsville, Pa., assignor to General Battery Corporation, Reading, Pa.
Filed May 3, 1984, Ser. No. 606,488
Term of patent 14 years
U.S. Cl. D13—10

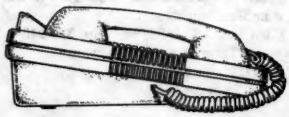


286,873
NON-ELECTRONIC SOUND AMPLIFIER HEADSET OR THE LIKE
Tameaki Ikeda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 23, 1984, Ser. No. 643,367
Claims priority, application Japan, Feb. 29, 1984, 59-7488
Term of patent 14 years
U.S. Cl. D14—36

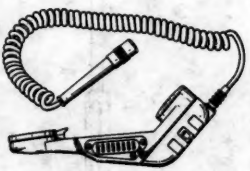
286,874
HEADSET
Richard A. Bertagna, San Dimas, and Rudolfo M. Ruiz, Temple City, both of Calif., assignors to Avicom International, Inc., Pasadena, Calif.
Filed Jul. 12, 1984, Ser. No. 630,099
Term of patent 14 years
U.S. Cl. D14—36

286,875
TELEPHONE SET
Ian A. Cameron, Newtown, Australia, assignor to Tytel Pty. Limited, New South Wales, Australia
Filed Sep. 7, 1984, Ser. No. 648,088
Claims priority, application Australia, Mar. 8, 1984, 6744/84
Term of patent 14 years
U.S. Cl. D14—53

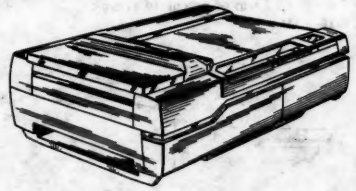
286,876
TELEPHONE
David A. Nogas, Ottawa, and John A. Mahan, Kanata, both of Canada, assignors to Mitel Corporation and Trillium Telephone Systems Inc., both of Kanata, Canada
Filed Dec. 4, 1984, Ser. No. 678,112
Claims priority, application Canada, Oct. 24, 1984, 24-10-84-4
Term of patent 14 years
U.S. Cl. D14—53



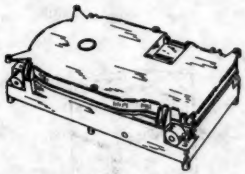
286,877
COMBINATION TELEPHONE HANDSET AND CONNECTOR
David Powell, London, England, assignor to Racal Acoustics Limited, Wembley, England
Filed Jul. 5, 1984, Ser. No. 627,690
Claims priority, application United Kingdom, Jan. 5, 1984, 1017175; Jan. 5, 1984, 1017177; Jan. 5, 1984, 1017178
Term of patent 14 years
U.S. Cl. D14—64



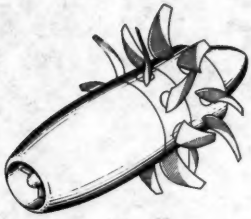
286,878
FACSIMILE RECORDER AND TRANSCEIVER
Fumiyo Kojima, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Oct. 20, 1982, Ser. No. 435,606
Claims priority, application Japan, Apr. 20, 1982, 57-016987
Term of patent 14 years
U.S. Cl. D14—94



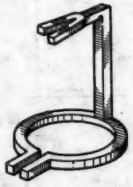
286,879
MAGNETIC DISC DRIVE HOUSING
Stephen R. Viskochil, San Jose, Calif., assignor to Priam Corporation, San Jose, Calif.
Filed Apr. 30, 1984, Ser. No. 605,168
Term of patent 14 years
U.S. Cl. D14—109



286,880
AIRCRAFT ENGINE OR SIMILAR ARTICLE
Leroy H. Smith, Jr., Cincinnati; Ambrose A. Hauser, Wyoming; William C. Ruehr, Cincinnati; Alan R. Stuart, West Chester, and Jack D. Wright, Mason, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Mar. 5, 1984, Ser. No. 586,372
Term of patent 14 years
U.S. Cl. D15—1

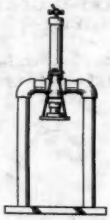


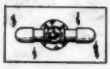
286,881
OIL-LEVEL CHECKING AIDE FOR VEHICLES
Howard L. Lynch, 1004 N. Thompson St. - #301, Richmond, Va. 23230
Filed Mar. 9, 1984, Ser. No. 587,998
Term of patent 14 years
U.S. Cl. D15—5



286,882
COMBINED REFRIGERATOR AND MICROWAVE OVEN
Jung P. Hong, Seoul, Rep. of Korea, assignor to Gold Star Company, Limited, Seoul, Rep. of Korea
Filed Dec. 14, 1983, Ser. No. 561,582
Term of patent 14 years
U.S. Cl. D15—81

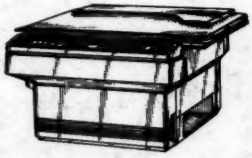
286,883
TRASH COMPACTOR
William D. McBee, 2100 Hayden Bridge Rd., Springfield, Oreg. 97477
Filed Mar. 12, 1984, Ser. No. 588,700
Term of patent 14 years
U.S. Cl. D15—123



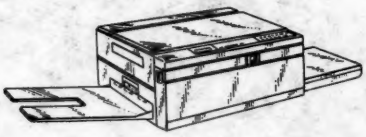


286,884
UNLOADER ATTACHMENT FOR A POULTRY PROCESSING MACHINE
Ronnie M. Conner, Dahlonega, and Grover S. Harben, Jr., Gainesville, both of Ga., assignors to Centennial Machine Company, Inc., Gainesville, Ga.
Filed Jun. 15, 1984, Ser. No. 621,174
Term of patent 14 years
U.S. Cl. D15—139

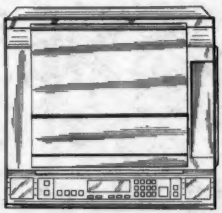
286,885
ELECTRONIC COPYING MACHINE
Tooru Okuyama, Isehara, and Kunio Hara, Chiba, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed Nov. 16, 1984, Ser. No. 672,871
Claims priority, application Japan, May 17, 1984, 59-19706
Term of patent 14 years
U.S. Cl. D16—31

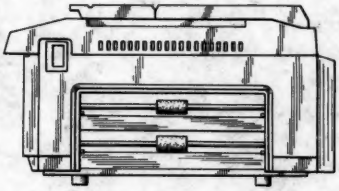


286,886
ELECTROPHOTOGRAPHIC COPIER
Toshihiko Kadota, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 27, 1984, Ser. No. 655,161
Claims priority, application Japan, Apr. 3, 1984, 59-13038
Term of patent 14 years
U.S. Cl. D16—31

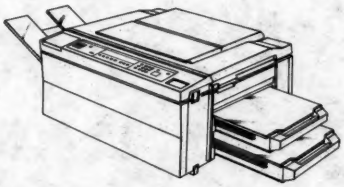


286,887
ELECTROSTATIC COPIER
Andrew T. Serbinski, Brooklyn, and Yasuhiro Okuda, New York, both of N.Y., assignors to Ricoh Company, Ltd., Japan
Filed Jan. 24, 1983, Ser. No. 460,631
Claims priority, application Japan, Jul. 22, 1982, 57-033284
Term of patent 14 years
U.S. Cl. D16—31

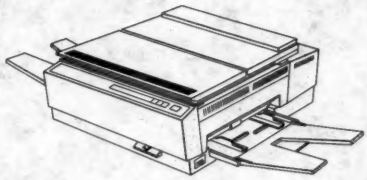




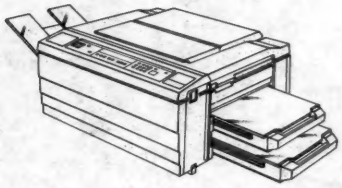
286,888
ELECTROPHOTOGRAPHIC COPYING MACHINE
Masanori Hashimoto; Akira Imai, both of Kanagawa, Japan, and Andrew T. Serbinski, Brooklyn, N.Y., assignors to Ricoh Company, Ltd., Japan
Filed Oct. 1, 1984, Ser. No. 656,446
Claims priority, application Japan, Mar. 30, 1984, 59-012383
Term of patent 14 years
U.S. Cl. D16—31



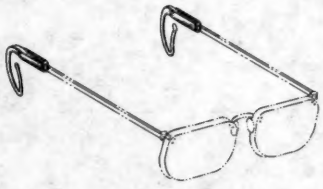
286,889
ELECTROPHOTOGRAPHIC COPYING MACHINE
Toshio Umino, Kanagawa, Japan, and Andrew T. Serbinski, Brooklyn, N.Y., assignors to Ricoh Company, Ltd., Japan
Filed Oct. 1, 1984, Ser. No. 656,447
Claims priority, application Japan, Mar. 30, 1984, 59-012387
Term of patent 14 years
U.S. Cl. D16—31



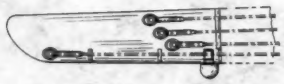
286,890
ELECTROPHOTOGRAPHIC COPYING MACHINE
Masanori Hashimoto, and Akira Imai, both of Kanagawa, Japan, assignors to Ricoh Company, Ltd., Japan
Filed Oct. 1, 1984, Ser. No. 656,450
Claims priority, application Japan, Mar. 30, 1984, 59-012384
Term of patent 14 years
U.S. Cl. D16—31



286,891
PAIR OF END PIECES FOR EYEGLASS TEMPLES
Wilhelm Anger, Via Brattas 4, CH-7500 St. Moritz, Switzerland
Filed Oct. 15, 1984, Ser. No. 660,737
Term of patent 14 years
U.S. Cl. D16—127

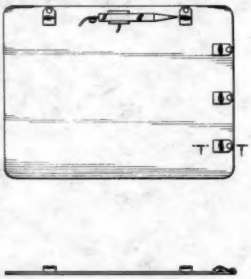


286,892
GUITAR HEAD
Philip Kubicki, and Geoffrey Richardson, both of P.O. Box 40110, Santa Barbara, Calif. 93103
Filed Jun. 6, 1984, Ser. No. 617,895
Term of patent 14 years
U.S. Cl. D17—20

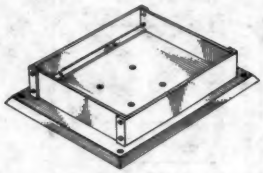


286,893
WRITING INSTRUMENT
Pierre Regnault, Valence, France, assignor to Etablissements Regnault, Valence, France
Filed Jan. 5, 1984, Ser. No. 568,424
Claims priority, application France, Jul. 6, 1983, 83 2547
Term of patent 14 years
U.S. Cl. D19—51

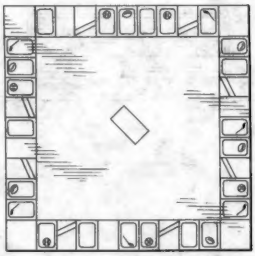
286,894
COMBINED WRITING BOARD AND PEN
David Haas, Suffern, N.Y., and Alexander J. Autote, Stamford, Conn., assignors to Temtec Inc., Suffern, N.Y.
Filed Dec. 22, 1983, Ser. No. 564,172
Term of patent 14 years
U.S. Cl. D19—88



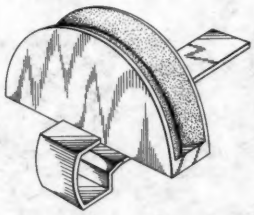
286,895
BASE FOR NEWSPAPER VENDING MACHINE
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.
Filed Mar. 7, 1984, Ser. No. 587,280
Term of patent 14 years
U.S. Cl. D20—8



286,896
GAME BOARD
Paul A. Thomas, 48 4th St., Toronto, Ontario, Canada M8V 2Y3
Filed Jun. 5, 1984, Ser. No. 617,496
Claims priority, application Canada, Apr. 11, 1984, 11-04-84-1
Term of patent 14 years
U.S. Cl. D21—27

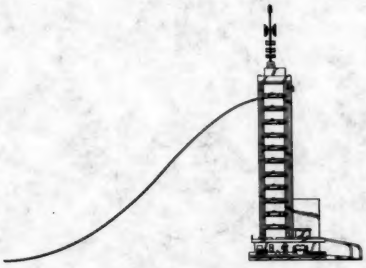


286,897
HOLDER FOR PLAYING CARDS
Walter N. Herbert, 709 W. Cedar, Kalamazoo, Mich. 49007
Filed May 7, 1984, Ser. No. 607,495
Term of patent 14 years
U.S. Cl. D21—54

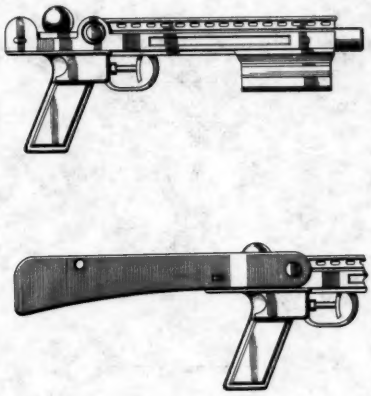


286,898
CRIB TOY
Masaharu Takei, Tokyo, Japan, and Tim Cahill, Westminster, Calif., assignors to Tomy Kogyo Co. Inc., Tokyo, Japan
Filed Nov. 30, 1984, Ser. No. 676,648
Term of patent 14 years
U.S. Cl. D21—63

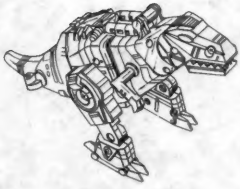
286,899
TOY TRACKWAY
Akifumi Miura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 23, 1985, Ser. No. 694,103
Claims priority, application Japan, Jul. 24, 1984, 59-31178
Term of patent 14 years
U.S. Cl. D21—143



286,900
COMBINED TOY SUB-MACHINE PISTOL AND DETACHABLE SHOULDER STOCK
Francis M. L. Barthropp, 4371 Marine Drive, West Vancouver, British Columbia, Canada V7V 1P3
Filed Aug. 15, 1984, Ser. No. 640,828
Term of patent 14 years
U.S. Cl. D21—147

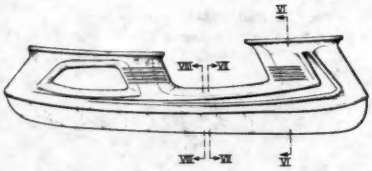


286,901
RECONFIGURABLE DINOSAURIAN TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,599
Claims priority, application Japan, Feb. 8, 1984, 59-4112
Term of patent 14 years
U.S. Cl. D21—148



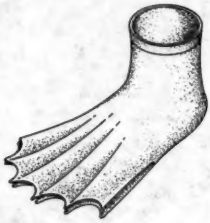
286,902
RACKET
Gordon J. Tilley, Manor Farm, Dunton Bassett, Lutterworth, Leicestershire LE17 5JJ, England
Filed Mar. 19, 1984, Ser. No. 590,706
Claims priority, application United Kingdom, Sep. 20, 1983, 1015224
Term of patent 14 years
U.S. Cl. D21—212

286,903
ICE SKATE
Oliviero Olivieri, Montebelluna, Italy, assignor to Icaro Olivieri & C. S.p.A., Treviso, Italy
Filed Apr. 20, 1984, Ser. No. 602,331
Claims priority, application Italy, Oct. 20, 1983, 23302/83[U]
Term of patent 14 years
U.S. Cl. D21—225



286,904
AQUATIC EXERCISE DEVICE
Young G. Kim, 10034 Burnham Ct., Riverside, Calif. 92503
Filed Dec. 6, 1984, Ser. No. 678,770
Term of patent 14 years
U.S. Cl. D21—238

286,905
SWIMMING FIN
Michael Korneski, 13075 Hilary Path, Hastings, Minn. 55033
Filed Sep. 26, 1984, Ser. No. 654,564
Term of patent 14 years
U.S. Cl. D21—239



286,906
SPRAYER
Andrew R. Gibbs, Rugby, England, assignor to Delta Buildings Products Limited, London, England
Filed Aug. 9, 1984, Ser. No. 639,116
Claims priority, application United Kingdom, Feb. 16, 1984, 1017938
Term of patent 14 years
U.S. Cl. D23—17

286,907

HYDRAULIC OR PNEUMATIC ACTUATOR UNIT FOR VALVES

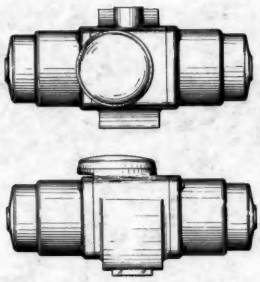
Bruno Hilpert, Diessenhofen, and Bruno Hunziker, Schaffhausen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Mar. 19, 1984, Ser. No. 590,726

Claims priority, application Hague, Sep. 19, 1983, DM/002880

Term of patent 14 years

U.S. Cl. D23—19



286,908

VENTILATOR FOR CONTAINERS

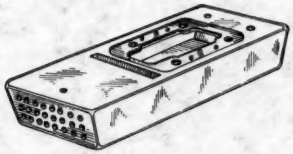
Shigeo Mizuno, Yamato, and Masaki Takahashi, Kawasaki, both of Japan, assignors to Nishiyama Corporation of America, New York, N.Y.

Filed Aug. 10, 1984, Ser. No. 639,923

Claims priority, application Japan, Apr. 23, 1984, 59-016566

Term of patent 14 years

U.S. Cl. D23—139



286,909

TOTAL OSSICULAR REPLACEMENT PROSTHESIS

Bruce Black, "Inchcolm", 73 Wickham Terr., Brisbane, Queensland, 4000, Australia

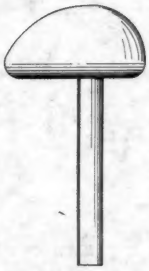
Filed Nov. 7, 1983, Ser. No. 549,493

Claims priority, application Australia, Oct. 19, 1983, 5366/83

The portion of the term of this patent subsequent to Nov. 25, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—33



286,910

PARTIAL OSSICULAR REPLACEMENT PROSTHESIS

Bruce Black, "Inchcolm", 73 Wickham Terr., Brisbane, Queensland, 4000, Australia

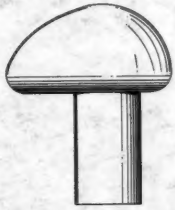
Filed Nov. 7, 1983, Ser. No. 549,494

Claims priority, application Australia, Oct. 19, 1983, 5365/83

The portion of the term of this patent subsequent to Nov. 25, 2000, has been disclaimed.

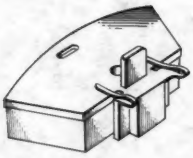
Term of patent 14 years

U.S. Cl. D24—33

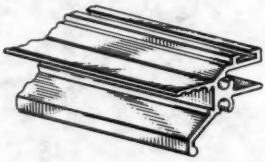


286,911
BABY BOTTLE
William O. Campbell, and Nickie G. Campbell, both of 2633 N. Country Club Rd., Muskogee, Okla. 74403
Filed Aug. 6, 1984, Ser. No. 638,037
Term of patent 14 years
U.S. Cl. D24—47

286,912
CONTAINER FOR REAGENT USE IN CHEMICAL CLINICAL ANALYSIS
Mario R. Andersen, Veradale, Wash., assignor to Instrumentation Laboratory, Lexington, Mass.
Filed Apr. 12, 1984, Ser. No. 599,514
Term of patent 14 years
U.S. Cl. D24—56

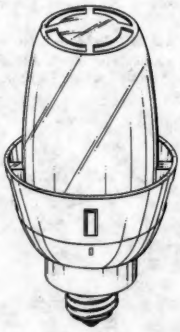


286,913
VENT LATCH JAMB
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,823
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74

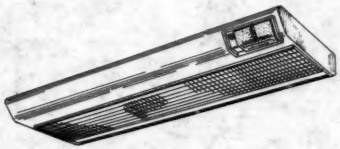


286,914
AIR-COOLED COMPACT ELECTRIC LAMP
Denis E. Bedel, Pittsburgh, Pa., assignor to North American Philips Electric Corp., New York, N.Y.
Division of Ser. No. 402,193, Jul. 26, 1982, Pat. No. Des. 278,462. This application Mar. 12, 1985, Ser. No. 710,824
Term of patent 14 years
U.S. Cl. D26—3

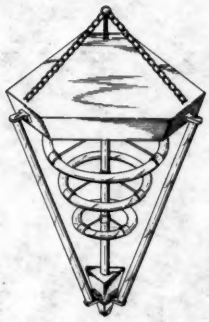
286,915
AIR-COOLED COMPACT ELECTRIC LAMP
Denis E. Bedel, Pittsburgh, Pa., assignor to North American Philips Electric Corp., New York, N.Y.
Division of Ser. No. 402,193, Jul. 26, 1982, Pat. No. Des. 278,462. This application Mar. 12, 1985, Ser. No. 710,893
Term of patent 14 years
U.S. Cl. D26—3



286,916
OVERHEAD DESK LIGHTING FIXTURE
William R. Worrell, Hopkins, Minn., assignor to All-Steel Inc., Aurora, Ill.
Filed Nov. 13, 1984, Ser. No. 670,039
Term of patent 14 years
U.S. Cl. D26—72



286,917
HANGING FLUORESCENT LIGHTING FIXTURE
John T. Shelton, III, 202 W. Marion St., Apt. 7, Knoxville, Iowa 50138
Filed Jan. 13, 1984, Ser. No. 570,354
Term of patent 14 years
U.S. Cl. D26—79

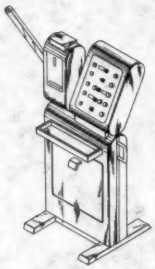


286,918
COMBINED ASHTRAY AND CIGARETTE SNUFFER
A. C. Valencia, P.O. Box 6962, Washington, D.C. 20032
Filed Nov. 14, 1983, Ser. No. 551,557
Term of patent 14 years
U.S. Cl. D27—22

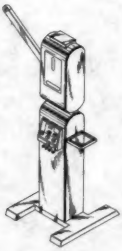
286,919
PHARMACEUTICAL TABLET
James W. Flockhart, New Fairfield, Conn., and Joseph Barone, Elmwood Park, N.J., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.
Filed Aug. 31, 1984, Ser. No. 646,194
Term of patent 14 years
U.S. Cl. D28—2

286,920
APPARATUS FOR AESTHETIC TREATMENTS OF FACE AND BODY
Koichi Takigawa, Tokyo, Japan, assignor to Takigawa Kabushiki-Kaisha, Tokyo, Japan
Filed Jul. 2, 1984, Ser. No. 626,626
Term of patent 14 years
U.S. Cl. D28—9

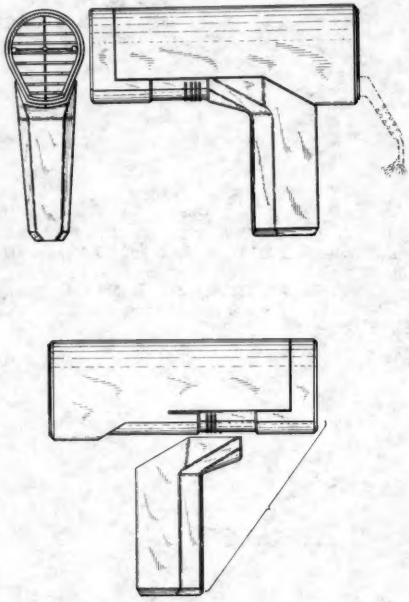
286,921
APPARATUS FOR AESTHETIC TREATMENTS OF FACE AND BODY
Koichi Takigawa, Tokyo, Japan, assignor to Takigawa Kabushiki-Kaisha, Tokyo, Japan
Filed Jul. 2, 1984, Ser. No. 626,550
Term of patent 14 years
U.S. Cl. D28—9



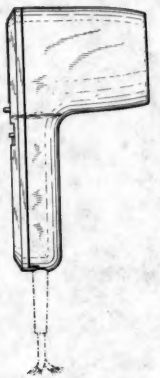
286,922
APPARATUS FOR AESTHETIC TREATMENTS OF FACE AND BODY
Koichi Takigawa, Tokyo, Japan, assignor to Takigawa Kabushiki-Kaisha, Tokyo, Japan
Filed Jul. 2, 1984, Ser. No. 626,627
Term of patent 14 years
U.S. Cl. D28—9

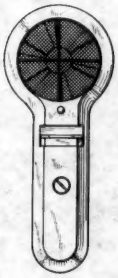


286,923
HAIR DRYER
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Oct, 31, 1984, Ser. No. 666,801
Term of patent 14 years
U.S. Cl. D28—13

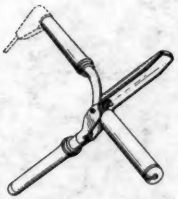


286,924
HAIR DRYER
Ronald L. Muller, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Oct. 31, 1984, Ser. No. 666,803
Term of patent 14 years
U.S. Cl. D28—13

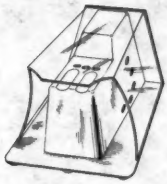




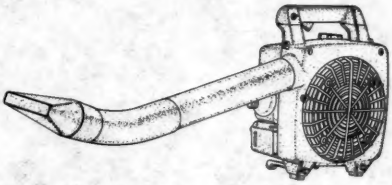
286,925
CURLING IRON
Gary E. Birks, 615 Ave. D, Redondo Beach, Calif. 90277
Filed Nov. 23, 1984, Ser. No. 674,332
Term of patent 14 years
U.S. Cl. D28—35



286,926
FINGER-NAIL DRYER
Calvert W. Billings, Jr., 362 Third St., Suite C, Laguna Beach, Calif. 92651
Filed Oct. 15, 1984, Ser. No. 661,254
Term of patent 14 years
U.S. Cl. D28—58

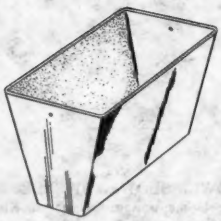


286,927
POWER BLOWER SWEEPER
Fumihiko Aiyama, Oome, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Filed Jun. 8, 1984, Ser. No. 618,672
Claims priority, application Japan, Dec. 24, 1983, 55460/1983
Term of patent 14 years
U.S. Cl. D32—15



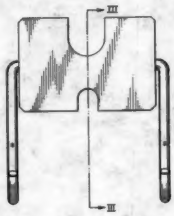
286,928
SHAMPOO CARTRIDGE FOR CARPET CLEANER
Edwin Fitzwater, Rahway, N.J., assignor to The Regina Co., Inc., Rahway, N.J.
Filed Mar. 2, 1984, Ser. No. 585,685
Term of patent 14 years
U.S. Cl. D32—25

286,929
BUCKET
Kenneth G. Brandon, 20 Queanbeyan Road, Captains Flat, New South Wales 2621, Australia
Filed Oct. 18, 1984, Ser. No. 662,370
Term of patent 14 years
U.S. Cl. D32—53.1



286,930
GOLF CART
Charles W. Plowey, 1145 Jancey St., Pittsburgh, Pa. 15206
Filed Sep. 24, 1984, Ser. No. 653,573
Term of patent 14 years
U.S. Cl. D34—15

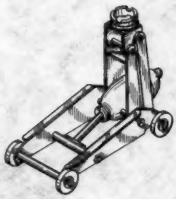
286,931
HOOK UNIT FOR A GOLF CART
Gerald G. Conklin, 3839 Meadow Ln., St. Joseph, Mich. 49085
Filed Jan. 6, 1984, Ser. No. 568,848
Term of patent 14 years
U.S. Cl. D34—27



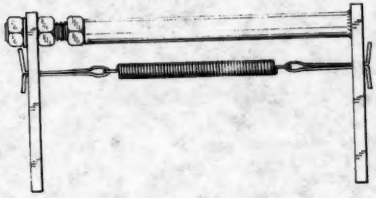
286,932
SPROCKET FOR AN ENDLESS CONVEYOR BELT
Robert H. Bode, and William P. Hidden, both of Wenham, Mass., assignors to The Cambridge Wire Cloth Co., Cambridge, Md.
Filed Feb. 6, 1984, Ser. No. 577,363
Term of patent 14 years
U.S. Cl. D34—29

286,933
LEVER FOR PORTABLE WRENCH SUPPORT
Kenneth G. Lymburner, Osage, Minn. 56570
Filed Feb. 23, 1984, Ser. No. 583,007
Term of patent 14 years
U.S. Cl. D34—31

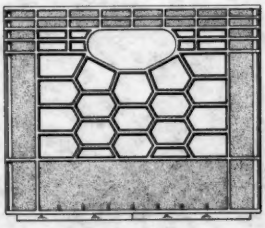
286,934
JACK
Michael Hung, 11th Fl., No. 624, Min Chuan E. Road, Taipei City, Taiwan
Filed Nov. 1, 1984, Ser. No. 667,147
Term of patent 14 years
U.S. Cl. D34—31



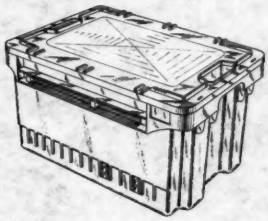
286,935
JACK FOR SUBTERRANEAN METER PIPES
Floyd A. Travis, Box 65, Elmore City, Okla. 73035
Filed Oct. 24, 1984, Ser. No. 664,336
Term of patent 14 years
U.S. Cl. D34—31



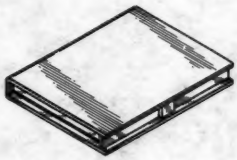
286,936
MILK CASE
Vincent J. Bitel, Sr., Rockfall, Conn., assignor to The Rogers Manufacturing Co., Rockfall, Conn.
Filed Oct. 20, 1983, Ser. No. 543,876
Term of patent 14 years
U.S. Cl. D34—43

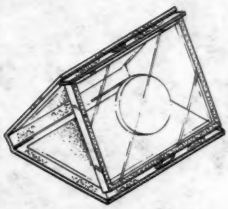


286,937
COMBINED STORAGE CONTAINER AND LID
Gerhard Schäfer, Salchendorf, Fed. Rep. of Germany, assignor to Fritz Schafer Gesellschaft mit beschrankter Haftung, Neunkirchen, Fed. Rep. of Germany
Filed Apr. 12, 1984, Ser. No. 599,455
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, MR 383
Term of patent 14 years
U.S. Cl. D34—43

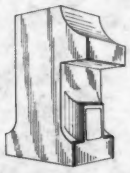


286,938
COIN DISPLAY CASE
Fred J. Povitz, Montreal, Canada, assignor to Corporation d'Emballage Universel, Canada
Filed Mar. 19, 1984, Ser. No. 590,771
Claims priority, application Canada, Feb. 16, 1984, 16-02-84-1
Term of patent 14 years
U.S. Cl. D99—34





286,939
REMOTE CUSTOMER BANKING KIOSK
James E. Barger, 511 E. 9th St., Metropolis, Ill. 62960
Filed Dec. 5, 1984, Ser. No. 678,600
Term of patent 14 years
U.S. Cl. D99—43



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF NOVEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Welstead, William J., Jr., 4,624,961, Cl. 514-403.000.

A/S Kongsberg Vapenfabrikk: *See*—
Stroem, Sigmunn, 4,624,104, Cl. 60-39.750.

A/S Tomra Systems: *See*—
Planke, Tore, 4,625,107, Cl. 250-223.00B.

Aagaard, Paul M., to Chevron Research Company. Method and means for storing a marine riser. 4,624,318, Cl. 166-359.000.

AB Sjolanders Smides & Mek. Verkstad: *See*—
Astrom, Jan; and Eriksson, Gunnar, 4,624,340, Cl. 182-2.000.

AB Volvo Penta: *See*—
Ohlsson, Lars-Erik; Soderbaum, Ulf; and Borgersen, Kjell, 4,624,643, Cl. 440-2.000.

Abbey, Kirk J.; Foss, David J.; and Kunz, Barbara L., to SCM Corporation. Method for cathodic electrocoating composition comprising pigmented aqueous latex binder. 4,624,762, Cl. 204-181.700.

Abbott Laboratories: *See*—
Rutnarak, Sangvorn, 4,624,667, Cl. 604-414.000.

Abderhalden, Herbert; Marr, Duncan B.; Heimann, Ivan; and Schmid, Jurg, to Niro-Plan AG. Sink unit particularly household kitchen sink unit. 4,624,020, Cl. 4-651.000.

Abe, Hiroki: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,624,476, Cl. 280-707.000.

Abex Corporation: *See*—
Frank, Earl E., 4,624,428, Cl. 246-276.000.

Abrams, Allan D.; Bausmith, Robert C.; Holland, Karey L.; and Holland, Steven P., to International Business Machines Corporation. Tailoring of via-hole sidewall slope. 4,624,740, Cl. 156-643.000.

Adachi, Hideki: *See*—
Komiya, Yutaka; Tomosada, Masahiro; Nakamura, Shinichi; Miyata, Masanori; Adachi, Hideki; and Hirose, Masayuki, 4,625,156, Cl. 318-85.000.

Adachi, Shigehito: *See*—
Inoue, Shigeo; Kimura, Yoshiharu; and Adachi, Shigehito, 4,624,920, Cl. 435-142.000.

Adachi, Yoshiharu; Kozakai, Asao; Watanabe, Shingo; Nakanishi, Nobuyasu; Oka, Hiroyuki; and Nakagawa, Fumio, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Regulator valve for hydraulic anti-skid apparatus. 4,624,508, Cl. 303-116.000.

ADC Telecommunications: *See*—
Vachhani, Vasantrai A., 4,624,521, Cl. 339-97.00P.

Adept Technology, Inc.: *See*—
Taenzer, Jon C., 4,625,158, Cl. 318-701.000.

Advance Lifts, Inc.: *See*—
Gould, Ronald R., 4,624,446, Cl. 254-88.000.

Advanced Medical Electronics Developments Limited Partnership: *See*—
Slavin, Martin J., 4,624,263, Cl. 128-710.000.

Advanced Micro Devices, Inc.: *See*—
Lee, Gil S.; and Kumar, Ashok, 4,625,127, Cl. 307-270.000.

Ae Plc: *See*—
Tommis, Norman, 4,624,831, Cl. 419-20.000.

Aerochem, Inc.: *See*—
Nelson, Carl, 4,624,169, Cl. 83-881.000.

Aftergut, Sigfried; and Cole, Herbert S., to General Electric Company. Dichroic liquid crystal compositions containing anthraquinone-based dyes. 4,624,532, Cl. 350-349.000.

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Matsuda, Hiro; Nakanishi, Hachiro; Kato, Masao; Orihashi, Yuji; Kobayashi, Norihisa; and Tsuchida, Eishun, 4,624,756, Cl. 204-59.00R.

Aguilera, Enoc C. Apparatus for manufacturing concrete posts. 4,624,439, Cl. 249-48.000.

Ahonen, Pentti. Window insulation. 4,624,077, Cl. 49-432.000.

Aida, Toshiyuki: *See*—
Umemura, Kaoru; Ishitani, Tohru; Aida, Toshiyuki; and Tamura, Hifumi, 4,624,833, Cl. 420-490.000.

Air Products and Chemicals, Inc.: *See*—
Dyer, Paul N.; Nordquist, Andrew F.; and Pierantozzi, Ronald, 4,624,942, Cl. 502-330.000.

Aire-Wrap, Inc.: *See*—
Stubbolo, Louis, 4,624,300, Cl. 165-45.000.

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Adachi, Yoshiharu; Kozakai, Asao; Watanabe, Shingo; Nakanishi, Nobuyasu; Oka, Hiroyuki; and Nakagawa, Fumio, 4,624,508, Cl. 303-116.000.
Kodama, Hisashi; and Ono, Takuro, 4,624,224, Cl. 123-90.460.
Murayama, Hiromi; and Minamoto, Naoki, 4,624,629, Cl. 417-407.000.

Ajemian, Krikor. Knee-supporting brace. 4,624,246, Cl. 128-80.00C.

Akahira, Isao: *See*—
Saito, Kengo; Ohtsu, Yasunori; Akahira, Isao; and Inoue, Makoto, 4,625,247, Cl. 360-71.000.

Akahira, Nobuo: *See*—
Kimura, Kunio; Takao, Masatoshi; Akahira, Nobuo; and Takenaga, Mutsuo, 4,624,914, Cl. 430-495.000.

Akashi, Tomohiko, to Honda Giken Kogyo Kabushiki Kaisha. Gear shift device for vehicles. 4,624,350, Cl. 192-4.00C.

Akatsuka, Hidehiko: *See*—
Ishikawa, Hiroshi; Matsui, Kazuma; Kurahashi, Takashi; Akatsuka, Hidehiko; and Yamada, Motokazu, 4,625,329, Cl. 382-1.000.

Akerlund, John: *See*—
Scuka, Viktor; and Akerlund, John, 4,625,256, Cl. 361-117.000.

Akesaka, Toshio, to Kabushiki Kaisha Iseki Kaihatsu Koki. Shield tunneling apparatus. 4,624,605, Cl. 405-144.000.

Akimura, Hitoshi: *See*—
Amano, Osamu; Kaiya, Atsushi; Tanaka, Takao; Akimura, Hitoshi; Tsujihata, Katsuhiro; and Hirata, Kouji, 4,624,976, Cl. 524-13.000.

Akira, Shuhara; Kenichiro, Yamanishi; and Yoshibumi, Minowa, to Mitsubishi Denki Kabushiki Kaisha. Method of producing silicon dioxide films. 4,624,859, Cl. 427-38.000.

Akiyama, Koji: *See*—
Kawamura, Takao; Nakayama, Yoshikazu; and Akiyama, Koji, 4,624,906, Cl. 430-84.000.

Akuzawa, Noboru: *See*—
Niimura, Isao; Motohashi, Katsuichi; Yamaga, Hiroyoshi; and Akuzawa, Noboru, 4,624,907, Cl. 430-106.000.

Alber, Norman E.; Dustoor, Manek R.; Hellier, Edward K.; and Scotese, Vito N., to Imperial Clevite Inc. Method of applying a coating to a metal substrate using brazing material and flux. 4,624,860, Cl. 427-46.000.

Albert, Manuel J.; Barnes, Graeme L.; and Bishop, Ruth F., to Royal Children's Hospital Research Foundation. Live attenuated human rotavirus vaccine. 4,624,850, Cl. 424-89.000.

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Alcan International Limited: *See*—
Miller, William S., 4,624,717, Cl. 148-12.70A.

Alexander, Carl A., to Battelle Memorial Institute. Metal-actinide nitride nuclear fuel. 4,624,828, Cl. 376-421.000.

Alexander, Stephen: *See*—
Green, Nicola; and Alexander, Stephen, 4,625,015, Cl. 530-324.000.

Alexander, William, to American Colloid Company. Method of temporarily inhibiting the swellability of water swellable clays and compositions. 4,624,982, Cl. 524-446.000.

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Reyes, Miquel A.; and Alfonso, Enivaldo, 4,624,124, Cl. 72-403.000.

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Funk, James E., 4,624,680, Cl. 44-51.000.

Allen, James H., to 'totes', incorporated. Umbrella handle. 4,624,276, Cl. 135-20.00R.

Allied Corporation: *See*—
Black, Carlin J.; and Bauer, Frederick N., Jr., 4,624,818, Cl. 264-255.000.
Dwyer, Frank J.; and Zwolinski, Leon M., 4,624,970, Cl. 521-131.000.
Eddy, William C., 4,624,336, Cl. 180-142.000.
Mares, Frank; Tang, Reginald Y.; Galle, James E.; and Federici, Rose M., 4,625,023, Cl. 540-539.000.
Qureshi, Humayun, 4,624,928, Cl. 436-179.000.
Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,624,695, Cl. 71-86.000.
Weber, Robert E.; Wakeman, Russell J.; and Driscoll, Barry J., 4,624,145, Cl. 73-861.310.
White, Rowland S., 4,624,516, Cl. 339-40.000.
Yamanis, Jean; Carlson, Emery J.; and Armor, John N., 4,624,939, Cl. 502-210.000.

Alpha Industries, Inc.: *See*—
Borzym, John J., 4,624,168, Cl. 83-862.000.

Alpha Therapeutic Corporation: *See*—
Chang, Chong E., 4,624,780, Cl. 210-195.100.

Alps Electric Co., Ltd.: *See*—
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ALZA Corporation: *See*—
Ayer, Atul D.; and Barclay, Brian, 4,624,847, Cl. 424-15.000.
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,624,945, Cl. 514-30.000.

Amano, Osamu; Kaiya, Atsushi; Tanaka, Takao; Akimura, Hitoshi; Tsujihata, Katsuhiro; and Hirata, Kouji, to Nippon Petrochemicals Co., Ltd.; and Ube Cycon, Ltd. Modeling material composition. 4,624,976, Cl. 524-13.000.

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Woffinden, Gary A.; and Petolino, Joseph A., Jr., 4,625,273, Cl. 364-200.000.

American Business Computers: *See*—
Shannon, Joseph W., 4,624,391, Cl. 222-53.000.

American Colloid Company: *See*—
Alexander, William, 4,624,982, Cl. 524-446.000.

American Cyanamid Company: *See*—
Morin, Louis G.; and Hoebel, Robert E., 4,624,751, Cl. 204-28.000.

American District Telegraph Company: *See*—
Guscott, John K., 4,625,115, Cl. 250-353.000.
Pantus, Math M. J., 4,625,199, Cl. 340-522.000.

American Home Products Corporation: *See*—
Jirkovsky, Ivo; King, Gary; Baudy, Reinhardt; and DeNoble, Victor, 4,624,954, Cl. 514-290.000.

American Hospital Supply Corporation: *See*—
Fletcher, Taylor C., 4,625,096, Cl. 219-331.000.
Lowery, Guy R.; Hilal, Said S.; Carson, Richard F., Jr.; and Pastrick, Danny L., 4,624,243, Cl. 128-6.000.
Marchioni, Bruce C.; and Posey, Dan, 4,624,101, Cl. 53-425.000.

American Safety Equipment Corporation: *See*—
Hollowell, William, 4,624,422, Cl. 242-107.200.

American Satellite Company: *See*—
Kim, Kap S.; Tisdale, William R. H.; Andrews, Bruce S.; Nash, T. Randolph; Kolodgie, Kathleen J.; and Eiserike, Steven S., 4,625,308, Cl. 370-104.000.

American Standard Inc.: *See*—
Hofstetter, Edward G., Jr., 4,624,415, Cl. 239-590.300.

American Tech Manufacturing, Inc.: *See*—
Linker, Frank V.; and Linker, Frank V., Jr., 4,624,160, Cl. 83-13.000.

Amerigo Technology Limited: *See*—
Clark, Greig J., 4,624,314, Cl. 166-271.000.

Anderson, Carl E. Scaffolding platform. 4,624,342, Cl. 182-223.000.

Anderson, Edwin V. Combined seed drill and fertilizer applicator. 4,624,196, Cl. 111-52.000.

Anderson, James D. Can identification method and apparatus. 4,624,181, Cl. 101-4.000.

Anderson, James E.: *See*—
Borkowicz, Jerzy; Anderson, James E.; and Livermore, Frederick C., 4,625,255, Cl. 361-91.000.

Andoh, Haruo: *See*—
Yamaguchi, Satoru; Satoh, Kozaburoh; Shimizu, Jozo; and Andoh, Haruo, 4,624,883, Cl. 428-212.000.

Andrews, Bruce S.: *See*—
Kim, Kap S.; Tisdale, William R. H.; Andrews, Bruce S.; Nash, T. Randolph; Kolodgie, Kathleen J.; and Eiserike, Steven S., 4,625,308, Cl. 370-104.000.

Andrews, Richard J.: *See*—
Bungay, Michael R.; Stevens, John W.; Turner, Richard M.; and Andrews, Richard J., 4,624,135, Cl. 73-119.00A.

Andrieux, Bernard; Bourven, Elisabeth; and Martin, Roger, to Delas-Weir. Apparatus for degassing a liquid fluid. 4,624,686, Cl. 55-196.000.

Ang, Khoen P. Method of personal self-defense. 4,624,389, Cl. 222-1.000.

Anhalt, John W.; and Goodman, David S., to ITT Corporation. Low insertion force connector system. 4,624,517, Cl. 339-75.00M.

Anne, Jean; Roy, Claude; and Fleuret, Daniel, to LCC Cice Compagnie Europeenne de Composants. Apparatus and process for the continuous production of capacitors of the stacked type. 4,624,037, Cl. 29-25.420.

Anorad: *See*—
Chitayat, Anwar, 4,625,132, Cl. 310-13.000.

Ansel, Robert E., to DeSoto, Inc. Soft and tough radiation-curable coatings for fiber optic application. 4,624,994, Cl. 525-440.000.

Antell, George R., to Standard Telephones and Cables Public Limited Company. Photodetector. 4,625,226, Cl. 357-30.000.

Anthony, Blair T., to General Electric Company. Sodium free silicone resin coating compositions. 4,624,870, Cl. 427-387.000.

Anzai, Satoru; and Okada, Masashi, to Nippon Kogaku K.K. Light irradiation control method for projection exposure apparatus. 4,624,551, Cl. 355-53.000.

Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivatives of tetrahydrobenzothiazole and herbicidal compositions containing the same as an active ingredient. 4,624,697, Cl. 71-90.000.

Aoki, Katsumichi; Shida, Takafumi; Kanda, Youichi; Satake, Keigo; Yamazaki, Shiro; and Chida, Tsuneaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Herbicidal tetrahydrobenzothiazolyl-1,3,5-triazinone derivatives and compositions thereof. 4,624,698, Cl. 71-90.000.

Aoyama, Masaaki: *See*—
Kitamura, Goro; Horiuchi, Hidenori; Aoyama, Masaaki; and Ito, Tokuhisa, 4,625,103, Cl. 250-201.000.

Apprille, Domenic V., Jr.; Chesnauskas, Ralph J.; Jacobson, Chester F.; and Trotta, Robert A., to Gillette Company, The. Shaving unit. 4,624,051, Cl. 30-50.000.

Arabori, Hideo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.

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Yamamoto, Masaichi; Araki, Seiichi; Yamamoto, Hiroshi; Yamatsu, Isao; Suzuki, Takeshi; Kajiwara, Akiharu; Suzuki, Yoshikazu; and Arai, Haruyoshi, 4,624,966, Cl. 514-724.000.

Araki, Hidemoto: *See*—
Ishiguro, Kazuyoshi; and Araki, Hidemoto, 4,624,034, Cl. 24-641.000.

Araki, Seiichi: *See*—
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Arens, Hans; Kern, Hans; and Haalberger, Richard, to Grunbeck Wasseraufbereitung GmbH. Tube separator with protection against contamination. 4,624,279, Cl. 137-218.000.

Arent, Gordon R. Flush mounted suspended ceiling system. 4,624,088, Cl. 52-484.000.

Arimond, Timothy V., to Surgidev Corp. Drug dispensing system. 4,624,661, Cl. 604-151.000.

Arioka, Hiroyuki: *See*—
Ishizaki, Hideki; Arioka, Hiroyuki; and Ide, Toshiaki, 4,624,892, Cl. 428-323.000.

Armco Inc.: *See*—
Noel, Robert J.; and Banik, Anthony, 4,624,716, Cl. 148-12.70N.

Armor, John N.: *See*—
Yamanis, Jean; Carlson, Emery J.; and Armor, John N., 4,624,939, Cl. 502-210.000.

Armstrong-Blum Mfg. Co.: *See*—
Stefanic, Joseph M., 4,624,167, Cl. 83-802.000.

Armstrong Store Fixture Corporation: *See*—
Pfeifer, William, 4,624,431, Cl. 248-215.000.

Armstrong World Industries, Inc.: *See*—
Long, Harry F.; Misselhorn, Donald J.; and Tomchany, Michael, 4,624,213, Cl. 118-300.000.

Arndt, Charles J.: *See*—
Oury, Robert F.; and Arndt, Charles J., 4,624,357, Cl. 198-313.000.

Arnold, Jerold W., to General Electric Company. Apparatus for automatic coil feed. 4,624,162, Cl. 83-74.000.

Arnold, Kurt: *See*—
Kreitchman, Morton A.; and Arnold, Kurt, 4,624,441, Cl. 251-30.010.

Arrowsmith, David J.; and Clifford, Andrew W., to Secretary of State for Defence in Her Brittanic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The. Surface pretreatment of aluminium and aluminium alloys prior to adhesive bonding, electroplating or painting. 4,624,752, Cl. 204-37.600.

Arru, Pietro; Bona, Gioacchino; Curcio, Maria; and Vallana, Franco, to Sorin Biomedica S.p.A. Methods for manufacture of valve flaps for cardiac valve prostheses. 4,624,822, Cl. 264-544.000.

Arthur, James C.: *See*—
King, Peter C.; and Arthur, James C., 4,624,539, Cl. 350-632.000.

Asaba, Takao: *See*—
Watanabe, Mitsuo; and Asaba, Takao, 4,624,875, Cl. 428-41.000.

Asahi Glass Company Ltd.: *See*—
Kokubu, Yoshinori; and Chiba, Jiro, 4,624,934, Cl. 501-17.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kitamura, Goro; Horiuchi, Hidenori; Aoyama, Masaaki; and Ito, Tokuhisa, 4,625,103, Cl. 250-201.000.

Asakawa, Kenichi: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,625,172, Cl. 324-326.000.

Asako, Makoto, to Casio Computer Co., Ltd.; and Casio Electronics Manufacturing Co., Ltd. Magnification control device. 4,624,552, Cl. 355-55.000.

Asami, Kazutomo: *See*—
Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; Asami, Kazutomo; and Sugihara, Masahiro, 4,624,630, Cl. 418-63.000.

Asea Aktiebolag: *See*—
Fahlen, Nils, 4,625,254, Cl. 361-16.000.

Ash, Charles E.; Chambers, Scott W.; Jenkins, David R.; and Herliczek, Siegfried H., to Libbey-Owens-Ford Company. Vacuum ring for producing laminated glass. 4,624,731, Cl. 156-382.000.

Ashland Oil, Inc.: *See*—
Hettinger, William P., Jr.; and Lewis, James E., 4,624,773, Cl. 208-120.000.

Astrom, Jan; and Briksson, Gunnar, to AB Sjolanders Smides & Mek. Verkstad. Mobile working platform. 4,624,340, Cl. 182-2.000.

AT&T Bell Laboratories: *See*—
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, 4,625,078, Cl. 379-145.000.
Taylor, Robert L., 4,625,270, Cl. 363-39.000.

AT&T Technologies, Inc.: *See*—
Bosacchi, Bruno; and Oehrle, Robert C., 4,625,114, Cl. 250-341.000.
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, 4,625,078, Cl. 379-145.000.
Hayden, John R.; and Huetson, Curtis L., 4,624,302, Cl. 165-80.200.

Atlantic Richfield Company: *See*—
Berman, Elliot; and Eisner, Kimberly P., 4,625,070, Cl. 136-249.000.
Wilson, Robert, 4,624,484, Cl. 285-45.000.
Younes, Usama E., 4,625,004, Cl. 526-262.000.

Atlas Pencil Company Limited: *See—*
Carr, Raymond, 4,624,273, Cl. 132-88.700.
Atsumi, Morihiro: *See—*
Yoshida, Ichiro; Atsumi, Morihiro; Yamaguchi, Shunzo; Nakamura, Naotaka; and Yagi, Kenji, 4,625,085, Cl. 200-19.00R.
Atzrott, John E., to United States of America, Army. Parachute canopy reefing technique. 4,624,427, Cl. 244-152.000.
Au, Andrew T., to Dow Chemical Company, The. Process for the preparation of cyanomethyl carboxylates. 4,625,045, Cl. 558-345.000.
Audureau, Joel; Caron, Michel R.; and Hervais, Vincent, to Societe Chimique des Charbonnages S.A. Blown tubing method and apparatus. 4,624,823, Cl. 264-569.000.
Ausimont S.p.A.: *See—*
Milani, Federico; and Binaghi, Marco, 4,624,992, Cl. 525-257.000.
Austin, Michael; and Schofield, B. Lyle, to Austin, Michael. Fixed wing light aircraft. 4,624,425, Cl. 244-13.000.
Autoliv Development AB: *See—*
Grunewald, Hans-Joachim, 4,624,479, Cl. 280-808.000.
Automotive Products plc: *See—*
Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., 4,624,290, Cl. 141-1.000.
Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., 4,624,291, Cl. 141-1.000.
Nix, Richard A.; and Kudzia, Thomas J., 4,624,585, Cl. 384-296.000.
Autry Industries, Inc.: *See—*
Autry, James C., 4,624,062, Cl. 36-114.000.
Autry, James C., to Autry Industries, Inc. Sole with cushioning and braking spiroidal contact surfaces. 4,624,062, Cl. 36-114.000.
Averette, Julius P., to Dynatech Precision Sampling Corporation. Automatic fluid injector. 4,624,148, Cl. 73-864.210.
Avila, Robert M.; and Hoffman, Glenn A., Jr. Hydraulic press. 4,624,126, Cl. 72-453.140.
AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H.: *See—*
Wunsche, Peter, 4,624,227, Cl. 123-198.00C.
Avram, Elena: *See—*
Revici, Emanuel, 4,624,851, Cl. 424-128.000.
Axelrod, Robert J.; and Cooper, Glenn D., to General Electric Company. Flame retardant polyphenylene ether-polystyrene blends of increased heat resistance and method of achievement. 4,624,979, Cl. 524-140.000.
Ayer, Atul D.; and Barclay, Brian, to ALZA Corporation. Drug delivery device for programmed delivery of beneficial drug. 4,624,847, Cl. 424-15.000.
B.C.S.I. Laboratories, Inc.: *See—*
Sagi, Zsigmond L., 4,624,264, Cl. 128-736.000.
B.E.L-Tronics Limited: *See—*
Sagl, Rudolf J. C., 4,625,210, Cl. 342-20.000.
Babbitt, William M.: *See—*
Marra, Jerome F.; and Babbitt, William M., 4,624,693, Cl. 65-1.000.
Babcock & Wilcox Company, The: *See—*
Dooley, Ray A., 4,624,824, Cl. 376-204.000.
Babcock, William W.: *See—*
Tomczak, Roman M.; Babcock, William W.; and Petsche, Lee E., 4,624,029, Cl. 17-1.00R.
Badesha, Santokh S.; Smith, Thomas W.; and Tarnawskyj, Ihor W., to Xerox Corporation. Coreduction process for incorporation of halogens into chalcogens and chalcogenide alloys. 4,624,701, Cl. 75-0.50A.
Badia, Frank A., to Inco Alloys International, Inc. Weld wire from extruded nickel containing powder. 4,624,706, Cl. 75-246.000.
Badische Corporation: *See—*
Gusack, James A.; and Smith, Thomas E., 4,624,817, Cl. 264-225.000.
Baggott, George T.; and Cooperrider, Myron T., to Crescent Metal Products, Inc. Gas convection oven with egg-shaped heat exchanger tube. 4,624,301, Cl. 165-47.000.
Baginski, Albert R., to Illinois Tool Works Inc. Roofing membrane fastener. 4,624,092, Cl. 52-713.000.
Baier, Manfred: *See—*
Tanswell, Paul; Baier, Manfred; and Lenz, Helmut, 4,624,930, Cl. 436-500.000.
Baker, Daniel C., to Shell Oil Company. Particulates and iron cyanide complex removal. 4,624,837, Cl. 423-215.500.
Baker Oil Tools, Inc.: *See—*
Goad, Bobby F., 4,624,311, Cl. 166-125.000.
McStravick, David M.; and Chenoweth, David V., 4,624,485, Cl. 285-47.000.
Baker, Richard R.; Dashley, Frederick J.; McCormack, Anthony D.; and Greig, Colin C., to British-American Tobacco Company Limited. Smoking articles. 4,624,268, Cl. 131-332.000.
Baker, Ross G., Jr.; Calfee, Richard V.; Sanders, Richard S.; Vandegriff, Joe; and Warren, Jay, to Intermedics, Inc. Pacemaker with conditional atrial tracking capability. 4,624,260, Cl. 128-419.0PG.
Baldridge, Morris G.; and Sullaway, Bob L., to Halliburton Company. Super seal valve with mechanically retained seal. 4,624,316, Cl. 166-325.000.
Baldwin, Blair F. Emergency umbrella with head mountable to handle's other end. 4,624,275, Cl. 135-19.500.
Ball, Gregory A.: *See—*
Beam, Hoyt W.; Ball, Gregory A.; and Moore, Byron E., 4,624,198, Cl. 112-10.000.
Ball, Lawrence E.: *See—*
Weinert, Raymond J., Jr.; Benton, Kenneth C.; Desmond, Michael J.; Ball, Lawrence E.; and Curatolo, Barbara D., 4,625,002, Cl. 526-90.000.
Ballato, Arthur, to United States of America, Army. Piezoelectric microwave resonator using lateral excitation. 4,625,138, Cl. 310-320.000.
Bally Manufacturing Corporation: *See—*
Kaufman, Clarence D., 4,624,459, Cl. 273-143.00R.
Balteau, Patrick: *See—*
Peluso, Francesco; and Balteau, Patrick, 4,624,664, Cl. 604-256.000.
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, to BASF Aktiengesellschaft. Guide system and magnetic tape cassette comprising such a system. 4,625,252, Cl. 360-130.210.
Balzer, Wolf-Dieter; Lorenz, Klaus; Wolf, Helmut; Trieselt, Wolfgang; Stoeckigt, Dieter; and Hettche, Albert, to BASF Aktiengesellschaft. Fatty alcohol oxyalkylates, possessing blocked terminal groups, for industrial cleaning processes, in particular bottle-washing and metal-cleaning. 4,624,803, Cl. 252-527.000.
Bancroft, Eric E.: *See—*
Lysenko, Zenon; and Bancroft, Eric E., 4,624,757, Cl. 204-78.000.
Lysenko, Zenon; and Bancroft, Eric E., 4,624,758, Cl. 204-78.000.
Lysenko, Zenon; and Bancroft, Eric E., 4,624,759, Cl. 204-78.000.
Banda, Lionel A.; and Devon, Thomas J. Multi-wire mineral insulated cable thermocouple reference junction. 4,624,582, Cl. 374-181.000.
Bandel, David, to MTC-Choice, Inc. High percentage glycol fuel and burner. 4,624,633, Cl. 431-320.000.
Banik, Anthony: *See—*
Noel, Robert J.; and Banik, Anthony, 4,624,716, Cl. 148-12.70N.
Banks, Edwin R., to Data General Corporation. Table-driven apparatus for data display and modification. 4,625,294, Cl. 364-900.000.
Baranyi, Giuseppa: *See—*
Kazmaier, Peter M.; Burt, Richard A.; and Baranyi, Giuseppa, 4,624,904, Cl. 430-59.000.
Barclay, Brian: *See—*
Ayer, Atul D.; and Barclay, Brian, 4,624,847, Cl. 424-15.000.
Barmag Barmer Maschinenfabrik AG: *See—*
Oberstrass, Detlev, 4,624,103, Cl. 57-348.000.
Barnes, Graeme L.: *See—*
Albert, Manuel J.; Barnes, Graeme L.; and Bishop, Ruth F., 4,624,850, Cl. 424-89.000.
Barnes, Hugh V.; and Russell, William M., to T. I. Domestic Appliances Limited. Flame failure device. 4,624,632, Cl. 431-77.000.
Barnes, Johnny G.; Gaudet, James L.; Hurley, Patrick J.; and Neuman, Grover H., to International Business Machines Corporation. Impact printer with type font elements having mid-line pitch change capability. 4,624,591, Cl. 400-171.000.
Barnette, Rhodes H.: *See—*
Frye, Richard D.; Huff, John P.; and Barnette, Rhodes H., 4,624,206, Cl. 114-146.000.
Baron, Richard D.; Jones, Michael H.; and Kent, David E., to Lykes Pasco Packing Co. Hot beverage dispensing machine. 4,624,395, Cl. 222-129.100.
Barr, John D., to NL Petroleum Products, Limited. Manufacture of rotary drill bits. 4,624,830, Cl. 419-7.000.
Barraclough, David J., to Rolls-Royce plc. Molding of composite materials. 4,624,820, Cl. 264-512.000.
Barrington, Burchus Q., to Halliburton Company. Well tool with improved valve support structure. 4,624,317, Cl. 166-334.000.
Barten, Piet G. J.: *See—*
Gerritsen, Jan; Barten, Piet G. J.; and Mensies, Otto, 4,625,145, Cl. 313-413.000.
Bartolomeo, Mark E., to Eaton Corporation. Holographic test method for rotational effects on gears. 4,624,568, Cl. 356-347.000.
BASF Aktiengesellschaft: *See—*
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,625,252, Cl. 360-130.210.
Balzer, Wolf-Dieter; Lorenz, Klaus; Wolf, Helmut; Trieselt, Wolfgang; Stoeckigt, Dieter; and Hettche, Albert, 4,624,803, Cl. 252-527.000.
Keil, Michael; Becker, Rainer; Jahn, Dieter; Kolassa, Dieter; Schirmer, Ulrich; Will, Wolfgang; Wuerzer, Bruno; and Meyer, Norbert, 4,624,696, Cl. 71-88.000.
Schoettle, Klaus; Sold, Roland; Brinkmann, Uwe; and Wagner, Werner, 4,624,423, Cl. 242-199.000.
BASF Farben und Fasern Aktiengesellschaft: *See—*
Geist, Michael; Ott, Gunther; and Schon, Georg, 4,624,974, Cl. 523-414.000.
Bashaw, Lawrence D., to Honeywell Information Systems Inc. Test and maintenance method and apparatus for investigation of intermittent faults in a data processing system. 4,625,312, Cl. 371-16.000.
Bassetti, Larry W.; Kantor, Sherwood; and Richert, Janis K., to International Business Machines Corporation. Interacting print enhancement techniques. 4,625,222, Cl. 346-160.000.
Battelle Development Corporation: *See—*
van Tao, Nguyen; and Bellmann, Gunter, 4,624,971, Cl. 522-37.000.
Battelle Memorial Institute: *See—*
Alexander, Carl A., 4,624,828, Cl. 376-421.000.
Baudoin, Andre ; and Traiteur, Rene , to Novatome. Steam generators having a central body of the sodium-water type. 4,624,217, Cl. 122-32.000.
Baudy, Reinhardt: *See—*
Jirkovsky, Ivo; King, Gary; Baudy, Reinhardt; and DeNoble, Victor, 4,624,954, Cl. 514-290.000.

Bauer, Frederick N., Jr.: *See*—
Black, Carlin J.; and Bauer, Frederick N., Jr., 4,624,818, Cl. 264-255.000.

Bauer, Sigrid: *See*—
Zweifel, Hans; Bauer, Sigrid; and Meier, Kurt, 4,624,912, Cl. 430-258.000.

Baumberg, Iosif. Method of and system for representing information data. 4,625,242, Cl. 358-209.000.

Bauml, Wolfgang; and Mosig, Ernst, to Webasto-Werk W. Baier GmbH & Co. Heater, particularly an auxiliary vehicle heater. 4,624,218, Cl. 122-136.00R.

Bausmith, Robert C.: *See*—
Abrams, Allan D.; Bausmith, Robert C.; Holland, Karey L.; and Holland, Steven P., 4,624,740, Cl. 156-643.000.

Bayer Aktiengesellschaft: *See*—
Elbe, Hans-Ludwig, 4,625,066, Cl. 568-308.000.
Fischer, Wolfgang; and Kniege, Wilfried, 4,625,008, Cl. 526-283.000.
Konig, Klaus; Pedain, Josef; and Woynar, Helmut, 4,625,052, Cl. 560-335.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,624,981, Cl. 524-326.000.

Bazell, Seymour: *See*—
Goldberg, Edward M.; and Bazell, Seymour, 4,624,659, Cl. 604-121.000.

Bazzurro, Andrea, to Bulloneria Barge S.p.A. Method for the manufacture of a self-locking nut. 4,624,024, Cl. 10-86.00A.

BBC Aktiengesellschaft Brown, Boveri & Cie.: *See*—
Kanngiesser, Karl-Werner, 4,625,269, Cl. 363-35.000.

BBC Brown, Boveri & Company, Limited: *See*—
Lang, Helmut V., 4,624,111, Cl. 60-694.000.
Odermatt, Robert, 4,624,584, Cl. 384-114.000.

Beall, George H.; Doman, Robert C.; and Pinckney, Linda R., to Corning Glass Works. Sodium fluormica glass-ceramics. 4,624,933, Cl. 501-3.000.

Beam, Hoyt W.; Ball, Gregory A.; and Moore, Byron E., to Cannon Mills Company. Method and apparatus for fabricating pillowcases with attached hems. 4,624,198, Cl. 112-10.000.

Bechert, Charles H., II. Intraocular lens. 4,624,670, Cl. 623-6.000.

Becker, Horst: *See*—
Heidsiek, Horst; Jackel, Gernot; and Becker, Horst, 4,624,832, Cl. 420-442.000.

Becker, Karl: *See*—
Bickle, Wolfgang; Pfoh, Rolf; and Becker, Karl, 4,624,887, Cl. 428-256.000.

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Keil, Michael; Becker, Rainer; Jahn, Dieter; Kolassa, Dieter; Schirmer, Ulrich; Will, Wolfgang; Wuerzer, Bruno; and Meyer, Norbert, 4,624,696, Cl. 71-88.000.

Becton, Dickinson and Company: *See*—
Burns, James A., 4,624,253, Cl. 128-314.000.

Bee Chemical Co.: *See*—
Jarzombek, Richard E.; and Moeller, Raymond J., 4,624,983, Cl. 524-474.000.

Beery, Jack, to ITT Corporation. Capsule rupture printing system. 4,624,560, Cl. 355-27.000.

Bell & Howell Company: *See*—
Johnson, Delmar R., 4,624,558, Cl. 355-100.000.

Bell, John H., Jr., to Du Pont de Nemours, E. I., and Company. Method for reducing broken fibers on the surface of a carbon fiber yarn bundle. 4,624,102, Cl. 57-296.000.

Bellmann, Gunter: *See*—
van Tao, Nguyen; and Bellmann, Gunter, 4,624,971, Cl. 522-37.000.

Belna, David. Linear induction semiconductor wafer transportation apparatus. 4,624,617, Cl. 414-347.000.

Bender + Co. Gesellschaft mbH: *See*—
Kriwetz, Gert; and Gartner, Karl, 4,625,118, Cl. 250-432.0PD.

Bender, Edward J.; Patrick, E. Vincent; and Franseen, Richard E., to United States of America, Army. Nonlinear gain microchannel plate image intensifier tube. 4,625,106, Cl. 250-213.0VT.

Bengtson, Rodney L. Boot carrier frame. 4,624,496, Cl. 294-148.000.

Benjamin, James A.: *See*—
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,624,533, Cl. 350-354.000.

Benn, Raymond C.: *See*—
Jatkar, Arun D.; Gilman, Paul S.; and Benn, Raymond C., 4,624,705, Cl. 75-239.000.

Bennett, David M., to Boeing Company, The. Quick release tool holder for robots. 4,624,043, Cl. 29-568.000.

Benton, Kenneth C.: *See*—
Weinert, Raymond J., Jr.; Benton, Kenneth C.; Desmond, Michael J.; Ball, Lawrence E.; and Curatolo, Barbara D., 4,625,002, Cl. 526-90.000.

Benton, William M.; and Mee, William W., to Vericard Corporation. Data logging and transfer system using portable and resident units. 4,625,276, Cl. 364-408.000.

Berardo, Riccardo, to Minnesota Mining and Manufacturing Company. X-ray film package for dental use. 4,625,325, Cl. 378-168.000.

Berg, Arthur A.; and Lissau, Frederic, to Sloan Valve Company. Vehicle slack adjusters. 4,624,345, Cl. 188-196.00M.

Berger, Heinz: *See*—
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,625,252, Cl. 360-130.210.

Berger, Henri; and Lapeyre, Didier, to Berger, Henri. Apparatus and process for very rapidly measuring the heart beat rate. 4,624,262, Cl. 128-689.000.

Berger, Michael F., to Tandy Corporation. Dynamic memory refresh circuit. 4,625,301, Cl. 365-222.000.

Berggren, Anders; Rohman, Hakan A. E.; and Ostrup, Leif T. Surgical instrument for performing anastomosis. 4,624,257, Cl. 128-334.00C.

Berman, Elliot; and Eisner, Kimberly P., to Atlantic Richfield Company. Laminated thin film solar module. 4,625,070, Cl. 136-249.000.

Berndt, Malte; and Ksinsik, Dieter, to DODUCO K.G. Dr. Eugen Durrwachter. Process of manufacturing a catalyst for purifying the exhaust gases from internal combustion engines and catalyst prepared by the process. 4,624,941, Cl. 502-302.000.

Bernhardt, Gunther; and Hanisch, Horst, to Dynamit Nobel Aktiengesellschaft. Adhesivizing agent copolymers containing both acrylate or methacrylate groups and alkoxyalyl groups. 4,625,006, Cl. 526-279.000.

Bernini, Giuseppe, to Secifarma S.p.A. Process for the resolution of (+)-6-methoxy-α-methyl-2-naphthaleneacetic acid into the corresponding enantiomers. 4,625,054, Cl. 562-401.000.

Berrondo, Antonino: *See*—
Breesch, Louis; and Berrondo, Antonino, 4,625,073, Cl. 174-72.00R.

Berry, Robert J. Emergency battery cell monitor. 4,625,201, Cl. 340-636.000.

Berta, Dominic A., to Hercules Incorporated. Thermoplastic elastomers containing cross-linked epihalohydrin rubbers. 4,624,989, Cl. 525-187.000.

Bertolette Machines, Inc.: *See*—
Marracino, Nicholas J., 4,624,123, Cl. 72-110.000.

Bertollini, Gary P., to General Motors Corporation. Fiber optic displacement sensor. 4,624,570, Cl. 356-373.000.

Bertram, Paul F., to Lee-Rowan Company. Adjustable wire shelf and bracket. 4,624,376, Cl. 211-187.000.

Berwind Corporation: *See*—
Collins, Robert C., 4,624,139, Cl. 73-304.00C.

Best, Donald C., to Union Carbide Corporation. Potentiated nickel catalysts for amination. 4,625,030, Cl. 544-358.000.

Bethlehem Steel Corporation: *See*—
Cramb, Alan W.; and Byrne, Michael, 4,624,707, Cl. 75-257.000.

BICC Public Limited Company: *See*—
Buck, John S.; and Owens, David, 4,624,562, Cl. 356-73.100.

Bichler, Helmut, to Siemens Aktiengesellschaft. Integrated semiconductor circuit with a ring oscillator. 4,625,181, Cl. 331-57.000.

Bickle, Wolfgang; Pfoh, Rolf; and Becker, Karl, to Kolbenschmidt AG. Material for sliding surface bearings. 4,624,887, Cl. 428-256.000.

Biffle, Lewis L.; and Larson, Chad R., to International Anasazi, Inc. Telephone bridge method and apparatus. 4,625,077, Cl. 379-28.000.

Bilskade-Service HB: *See*—
Jakobsson, Klas, 4,624,080, Cl. 51-410.000.

Biltwell Company, Inc., The: *See*—
Russell, Jackie D.; and Linneman, Kent M., 4,624,615, Cl. 414-97.000.

Binaghi, Marco: *See*—
Milani, Federico; and Binaghi, Marco, 4,624,992, Cl. 525-257.000.

Biomeasure, Inc.: *See*—
Kim, Sun H., 4,625,026, Cl. 544-249.000.

Biotek, Inc.: *See*—
Nuwayser, Elie S., 4,624,665, Cl. 604-307.000.

Birchak, James R.: *See*—
Wisler, MacMillan M.; Birchak, James R.; and Meador, Richard A., 4,625,173, Cl. 324-351.000.

Biro, Alexander J., to Winchester Industries, Inc. Thermally insulated window sash construction. 4,624,091, Cl. 52-656.000.

Bischoff, Albrecht; Eisentraut, Holger; and Schmidt, Joachim, to W.C. Heraeus GmbH. Multi-layer electrical support substrate. 4,625,228, Cl. 357-70.000.

Bishop, Ruth F.: *See*—
Albert, Manuel J.; Barnes, Graeme L.; and Bishop, Ruth F., 4,624,850, Cl. 424-89.000.

Bithell, Roger M.; and Slomowitz, Harry, to Tegal Corporation. Pin lift plasma processing. 4,624,728, Cl. 156-345.000.

Bituma Construction Equipment Company: *See*—
Dillman, Bruce A., 4,624,576, Cl. 366-63.000.

Bivin, Ken L., to Maverick Microsystems, Inc. Full field MICR encoder. 4,624,588, Cl. 400-105.000.

Biziere, Kathleen; Chambon, Jean-Pierre; and Hallot, Andre , to Sanofi. Pyridazine and pyrimidine compounds active on the central nervous system as sedatives or anticonvulsants. 4,624,952, Cl. 514-252.000.

BJ-Titan Services Company: *See*—
Dawson, Jeffrey C.; McDaniel, Robert R.; and Sedillo, Lawrence P., 4,624,795, Cl. 252-8.553.

Bjork, Anders K.; and Christensson, Erik G. 1-piperazinocarboxylates and pharmaceutical compositions containing them. 4,624,953, Cl. 514-255.000.

Black, Brent C.; Bradley, Bruce D.; and Haymore, Ralph B., to Envirotech Corporation. Apparatus for granular media filter. 4,624,783, Cl. 210-271.000.

Black, Carlin J.; and Bauer, Frederick N., Jr., to Allied Corporation. Rotational molding process using abrasive-resistant nylon composition. 4,624,818, Cl. 264-255.000.

Black, Jimmy C.; Roberts, Bruce E.; and Matlock, Dyer A., to Harris Corporation. Electrodeposition of submicrometer metallic interconnect for integrated circuits. 4,624,749, Cl. 204-15.000.

Blaha, Matthew S.: *See*—
Tulpule, Bhalchandra R.; and Blaha, Matthew S., 4,625,307, Cl. 370-85.000.

Blaskis, Edward A.; and Carlson, Roland W., to Technicare Corporation. High vacuum rotating anode x-ray tube. 4,625,324, Cl. 378-130.000.

Blattler, Walter A.: *See—*
Senter, Peter D.; Lambert, John M.; and Blattler, Walter A., 4,625,014, Cl. 530-300.000.

Blaupunkt-Werke GmbH: *See—*
Strohmeier, Wolfgang, 4,625,263, Cl. 362-32.000.

Blezard, Robert C.: *See—*
Evans, Robert D.; and Blezard, Robert C., 4,624,878, Cl. 428-95.000.

Bliss, Dan E.: *See—*
McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E., 4,624,753, Cl. 204-58.500.
McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E., 4,624,754, Cl. 204-58.500.
McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E., 4,624,755, Cl. 204-58.500.

Blocker, Shirley L. Toy furniture device, and methods of constructing and utilizing same. 4,624,649, Cl. 446-482.000.

Bloesl, Siegfried: *See—*
Schaper, Ulf-Armin; Streschnak, Benno; Bloesl, Siegfried; and Sommer, Walter, 4,624,802, Cl. 252-522.00R.

Blum, Helmut; and Hemmann, Siglinde, to Henkel Kommanditgesellschaft auf Aktien. 4-dimethylamino-1-hydroxybutane-1,1-diphosphonic acid, salts thereof, and processes therefor. 4,624,947, Cl. 514-108.000.

Blum, Kenneth P., to Thomas & Betts Corporation. Coaxial cable clamp. 4,624,520, Cl. 339-97.00R.

Board of Regents, The University of Texas System: *See—*
Davis, Charles P.; and Outenreath, Robert, 4,624,835, Cl. 422-102.000.

Bocher, Jean-Loup, to Les Cables de Lyon. Radiating coaxial electric cable. 4,625,187, Cl. 333-237.000.

Bocker, Jurgen; Gersbach, Klaus; and Klein, Klaus W., to Rheinmetall GmbH. Penetrator projectiles. 4,624,187, Cl. 102-520.000.

Boeckmann, Eduard F. B., to GTE Communication Systems Corp. Integrated circuit temperature sensor. 4,625,128, Cl. 307-310.000.

Boehringer Ingelheim Vetmedica GmbH: *See—*
Kern, Otto; and Wilhelm, Franz, 4,624,960, Cl. 514-401.000.

Boehringer Mannheim GmbH: *See—*
Tanswell, Paul; Baier, Manfred; and Lenz, Helmut, 4,624,930, Cl. 436-500.000.

Boeing Company, The: *See—*
Bennett, David M., 4,624,043, Cl. 29-568.000.
Das, K. Bhagwan, 4,625,095, Cl. 219-137.0WM.
Pinson, George T., 4,624,424, Cl. 244-3.210.

Bogoch, Samuel. Recognins and their chemoreciprocals. 4,624,931, Cl. 436-528.000.

Bogoch, Samuel. Recognins and their chemoreciprocals. 4,624,932, Cl. 436-538.000.

Bohm, Manfred: *See—*
Nestel, Siegfried; and Bohm, Manfred, 4,625,108, Cl. 250-227.000.

Bona, Gioacchino: *See—*
Arru, Pietro; Bona, Gioacchino; Curcio, Maria; and Vallana, Franco, 4,624,822, Cl. 264-544.000.

Bonapace, Mario J. Knife sharpener. 4,624,079, Cl. 51-214.000.

Bonzer, William J.: *See—*
Duffy, John W.; Bonzer, William J.; Scott, Gary L.; Sickels, Dennis G.; and Zeigler, Ralph W., 4,624,442, Cl. 251-61.100.

Boole, Leon J. Portable drawer assembly. 4,624,502, Cl. 297-192.000.

Borck, Gordon T.: *See—*
Muench, Frank J.; and Borck, Gordon T., 4,625,196, Cl. 337-204.000.

Borgersen, Kjell: *See—*
Ohlsson, Lars-Erik; Soderbaum, Ulf; and Borgersen, Kjell, 4,624,643, Cl. 440-2.000.

Borkowicz, Jerzy; Anderson, James E.; and Livermore, Frederick C., to Northern Telecom Limited. Interactive overvoltage protection device. 4,625,255, Cl. 361-91.000.

Borzym, John J., to Alpha Industries, Inc. Apparatus for cutting heavy wall tube. 4,624,168, Cl. 83-862.000.

Bosacchi, Bruno; and Oehrle, Robert C., to AT&T Technologies, Inc. Method and apparatus for nondestructively determining the characteristics of a multilayer thin film structure. 4,625,114, Cl. 250-341.000.

Bosnyak, Robert J., to Monolithic Memories, Inc. Fusible link short detector with array of reference fuses. 4,625,162, Cl. 324-51.000.

Bottoms, James D. Karate and kick boxing protective boot. 4,624,015, Cl. 2-22.000.

Botzem, Werner; and Quillmann, Heinrich, to NUKEM GmbH. Device for the handling and protection of canisters for storing radioactive materials. 4,625,122, Cl. 250-506.100.

Bourgie, Paul, to Thomson CSF. Pivoting joint for ultra-high frequency waveguides. 4,625,188, Cl. 333-257.000.

Bourgoine, Edward C.: *See—*
Gile, Richard H.; and Bourgoine, Edward C., 4,624,236, Cl. 125-11.00R.

Bourne, Maurice W., Jr. Three-wheeled vehicle with controlled wheel and body lean. 4,624,469, Cl. 280-112.00A.

Bourven, Elisabeth: *See—*
Andrieux, Bernard; Bourven, Elisabeth; and Martin, Roger, 4,624,686, Cl. 55-196.000.

Bovino, Lawrence J.; Weiner, Maurice; and Burke, Terence, to United States of America, Army. Optically triggered bulk device Gunn oscillator. 4,625,182, Cl. 331-107.00G.

Bowen, William R.: *See—*
Pottinger, John S.; Turner, Andrew D.; Bowen, William R.; and Cox, Dennis R., 4,624,760, Cl. 204-141.500.

Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., to Commonwealth Aluminum Corporation. Aluminum wettable cathode material for use in aluminum reduction cell. 4,624,766, Cl. 204-294.000.

Boyd, Dana M.; and Bustin, Franz, to Mobil Oil Corporation. Method and apparatus for manufacturing draw tape bags. 4,624,654, Cl. 493-194.000.

Boyle, Francis T., to Imperial Chemical Industries PLC. Antifungal azole compounds. 4,625,036, Cl. 548-262.000.

Boyle, Michael C.: *See—*
Golder, Willis E.; Ierardi, Joseph A.; Staples, Robert E.; and Boyle, Michael C., 4,625,164, Cl. 324-158.00F.

Bradley, Bruce D.: *See—*
Black, Brent C.; Bradley, Bruce D.; and Haymore, Ralph B., 4,624,783, Cl. 210-271.000.

Braglia, Gabriele: *See—*
Scolastico, Carlo; and Braglia, Gabriele, 4,624,946, Cl. 514-77.000.

Bratkowski, Walter V.: *See—*
Wafer, John A.; and Bratkowski, Walter V., 4,625,190, Cl. 335-20.000.

Bredow, Walter; and Schwarze, Albert, to C. Behrens AG. Arrangement for storing and exchanging of tools in a power tool particularly a revolving cutting press. 4,624,044, Cl. 29-568.000.

Bredow, Walter; and Schwarze, Albert, to C. Behrens AG. Power tool, particularly revolving cutting press with tool receiving means suitable for a remotedly controlled exchange. 4,624,165, Cl. 83-685.000.

Breesch, Louis; and Berrondo, Antonino, to Raychem Corporation. Cable having a branch-off region sealed with a branch-off article and method of making same. 4,625,073, Cl. 174-72.00R.

Bresciani, Ferruccio; and Santambrogio, Pietro, to Vitreal Specchi S.p.A. Machine for continuously etching a surface of glass sheets. 4,624,729, Cl. 156-345.000.

Bridgestone Corporation: *See—*
Takeshita, Michitaka, 4,624,977, Cl. 524-87.000.
Takiguchi, Eiji, 4,624,296, Cl. 152-209.00R.

Bridier, Robert, to Compagnie Industrielle d'Applications Thermiques C.I.A.T. Machine for the manufacture of tubes deformed to provide a helicoidal profile for heat exchangers and similar applications. 4,624,122, Cl. 72-70.000.

Bries, James L., to Minnesota Mining and Manufacturing Company. Launderable textile sizing having stain resistance and soil release. 4,624,889, Cl. 428-264.000.

Brinkmann, Uwe: *See—*
Schoettle, Klaus; Sold, Roland; Brinkmann, Uwe; and Wagner, Werner, 4,624,423, Cl. 242-199.000.

Brinly-Hardy Co., Inc.: *See—*
Doering, Charles W., 4,624,195, Cl. 111-12.000.

Bristol-Myers Company: *See—*
Brundidge, Steven P.; Howell, Henry G.; Sapino, Chester, Jr.; and Tann, Chon-Hong, 4,625,020, Cl. 536-18.200.

British-American Tobacco Company Limited: *See—*
Baker, Richard R.; Dashley, Frederick J.; McCormack, Anthony D.; and Greig, Colin C., 4,624,268, Cl. 131-332.000.

Brogan, Robert W., to General Electric Company. Bearing lubrication device. 4,624,586, Cl. 384-307.000.

Brolin, Charles A. Gun security apparatus. 4,624,372, Cl. 211-4.000.

Bron, Alphonse: *See—*
Mock, Elmar; and Bron, Alphonse, 4,624,581, Cl. 368-282.000.

Brooks, Ralf M.; and Connell, Brian P., to NCR Canada Ltd. Thermal printhead life extension technique. 4,625,216, Cl. 346-76.0PH.

Brother Industries, Ltd.: *See—*
Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, 4,624,587, Cl. 400-83.000.

Broussard, Paul P.: *See—*
Faul, Donald; Broussard, Paul P.; and Granger, Donald W., 4,624,130, Cl. 73-40.700.

Brown, Thomas R.: *See—*
Mickelson, Roger D.; and Brown, Thomas R., 4,624,106, Cl. 60-452.000.

Brueggemann, Harry P., to Xerox Corporation. Scanning systems with polygon scanner having curved facets. 4,624,528, Cl. 350-6.700.

Brundidge, Steven P.; Howell, Henry G.; Sapino, Chester, Jr.; and Tann, Chon-Hong, to Bristol-Myers Company. Nucleoside process. 4,625,020, Cl. 536-18.200.

Brush, Robert W., Jr.; and Scharf, Robert M., to Thomas & Betts Corporation. Electrical connector with grounding clip. 4,624,515, Cl. 339-14.00R.

BTU Engineering Corporation: *See—*
Sarkozy, Robert F., 4,624,638, Cl. 432-253.000.

Buchler, Wilhelm, to Dyckerhoff & Widmann Aktiengesellschaft. Adjustable formwork for concrete structures. 4,624,440, Cl. 249-194.000.

Buchner, Olaf: *See—*
Klak, Roland; and Buchner, Olaf, 4,624,226, Cl. 123-179.00H.

Buchta, William M.: *See—*
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,624,766, Cl. 204-294.000.

Buck Chemisch-Technische Werke GmbH & Co.: *See—*
Widera, Axel; Schiessl, Alois; Hanser, Walter; Rayer, Peter; and Hieke, Klaus, 4,624,186, Cl. 102-336.000.

Buck, John S.; and Owens, David, to BICC Public Limited Company. Signal generator for aligning optical fibers. 4,624,562, Cl. 356-73.100.

Buechel, Frederick F.: *See—*
Pappas, Michael J.; and Buechel, Frederick F., 4,624,674, Cl. 623-22.000.

Bulloneria Barge S.p.A.: *See—*
Bazzurro, Andrea, 4,624,024, Cl. 10-86.00A.

Bulso, Joseph D., Jr.; and McClung, James A., to Redicon Corporation. Method and apparatus for controlling the spacing between a metal forming punch and a complemental die. 4,624,125, Cl. 72-453.130.

Bungay, Michael R.; Stevens, John W.; Turner, Richard M.; and Andrews, Richard J., to Lucas Industries public limited company. Fuel injection nozzles. 4,624,135, Cl. 73-119.00A.

Burgyan, Lajos, to Signetics Corporation. Control circuit for tape recorders. 4,625,246, Cl. 360-62.000.

Burke, Terence: *See—*
Bovino, Lawrence J.; Weiner, Maurice; and Burke, Terence, 4,625,182, Cl. 331-107.00G.

Burnett, William R.: *See—*
Krechmer, Kenneth R.; Milroy, James C.; Burnett, William R.; and Howell, Thomas A., 4,625,259, Cl. 361-340.000.

Burns, James A., to Becton, Dickinson and Company. Lancet. 4,624,253, Cl. 128-314.000.

Burns & McDonnell Engineering Co., Inc.: *See—*
Lueckenotte, Donald L.; and Kaltenbach, Robert P., 4,624,685, Cl. 55-13.000.

Burns, Richard H. Foldable utility cart. 4,624,467, Cl. 280-40.000.

Burrola, Henry G. Multi-purpose impact hand tool kit. 4,624,323, Cl. 173-90.000.

Burroughs Corporation: *See—*
Lake, Ralph J., Jr.; and Sudol, George A., 4,624,434, Cl. 248-454.000.
Murray, Lance R., 4,625,130, Cl. 307-468.000.

Burt, Richard A.: *See—*
Kazmaier, Peter M.; Burt, Richard A.; and Baranyi, Giuseppa, 4,624,904, Cl. 430-59.000.

Burth, Rolf D.: *See—*
Micic, Ljubomir; Burth, Rolf D.; Fischer, Thomas; and Schweer, Rainer, 4,625,153, Cl. 315-370.000.

Burzi, Giuseppe; Mengoli, Giovanni; and Pogliani, Luciano, to Telettra, Telefonia Elettronica e Radio S.p.A. Resonant circuit for the extraction of the clock frequency oscillation from the data flow. 4,625,185, Cl. 333-204.000.

Bushong, Richard R. Signal supporting apparatus. 4,625,265, Cl. 362-80.000.

Bustin, Franz: *See—*
Boyd, Dana M.; and Bustin, Franz, 4,624,654, Cl. 493-194.000.

Butcher, James S., to Motorola, Inc. Automatic bias circuit. 4,625,320, Cl. 375-76.000.

Byeseda, John J., to Combustion Engineering, Inc. Selective recovery of zinc from metal containing brines. 4,624,704, Cl. 75-101.0BE.

Byrne, Michael: *See—*
Cramb, Alan W.; and Byrne, Michael, 4,624,707, Cl. 75-257.000.

Byrnes, John, to Markel Industries, Inc. Apparatus for removing particulates. 4,624,690, Cl. 55-385.00R.

C. Behrens AG: *See—*
Bredow, Walter; and Schwarze, Albert, 4,624,044, Cl. 29-568.000.
Bredow, Walter; and Schwarze, Albert, 4,624,165, Cl. 83-685.000.

C. F. Braun & Co.: *See—*
Grotz, Bernard J., Jr., 4,624,842, Cl. 423-360.000.

Calder, Alan R.: *See—*
Malpas, Jon H.; and Calder, Alan R., 4,624,392, Cl. 222-83.000.

Calfee, Richard V.: *See—*
Baker, Ross G., Jr.; Calfee, Richard V.; Sanders, Richard S.; Vandegriff, Joe; and Warren, Jay, 4,624,260, Cl. 128-419.0PG.

Callahan, James F.; Moore, Michael L.; and Yim, Nelson C., to Smith-Kline Beckman Corporation. Aromatic basic-tailed vasopressin antagonists. 4,624,943, Cl. 514-11.000.

Camacho, David P.; and Camacho, Salvador L., to Plasma Energy Corporation. Plasma arc bulk air heating apparatus. 4,625,092, Cl. 219-121.0PM.

Camacho, Salvador L.: *See—*
Camacho, David P.; and Camacho, Salvador L., 4,625,092, Cl. 219-121.0PM.

Cameron, Evan S.; and Shaw, Linda P., to Ferranti, plc. Radiation-utilizing measurement system. 4,624,527, Cl. 350-6.500.

Canada, Her Majesty the Queen in Right of: *See—*
Conway, Larry J.; and Cornish, William D., 4,625,177, Cl. 328-187.000.

Canadian Patents and Development Limited: *See—*
Zwarts, Cornelis M. G., 4,625,186, Cl. 333-216.000.

Cannon Mills Company: *See—*
Beam, Hoyt W.; Ball, Gregory A.; and Moore, Byron E., 4,624,198, Cl. 112-10.000.
Fisher, William S., 4,624,200, Cl. 112-121.120.

Canon Kabushiki Kaisha: *See—*
Endo, Makoto; Ono, Satoshi; Toda, Takao; Kashiwagi, Kazuo; Yanagi, Masaaki; and Saito, Yoshihiro, 4,624,547, Cl. 355-14.00E.
Kataoka, Hiroyuki, 4,625,151, Cl. 315-241.00P.
Komiya, Yutaka; Tomosada, Masahiro; Nakamura, Shinichi; Miyata, Masanori; Adachi, Hideki; and Hirose, Masayuki, 4,625,156, Cl. 318-85.000.
Nagashima, Yoshitake, 4,625,220, Cl. 346-140.00R.
Nakagawa, Katsumi; Komatsu, Toshiyuki; Osada, Yoshiyuki; Omata, Satoshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,625,224, Cl. 357-23.700.
Sato, Hiroshi; Kushida, Naoki; and Tanaka, Kazumi, 4,624,891, Cl. 428-321.300.
Takayanagi, Yoshiaki, 4,624,548, Cl. 355-14.00D.
Tokuhara, Mitsuhiro; and Ogawa, Hiroshi, 4,624,555, Cl. 355-71.000.

Capetronic (BSR) Ltd.: *See—*
Ma, John, 4,625,183, Cl. 331-117.00R.

Cappel, Bert: *See—*
Kunkel, Fred; Hummel, Peter; Cappel, Bert; Schniggenfittig, Gunther; and Kerber, Helmut, 4,624,183, Cl. 101-365.000.

Cappi, Silvano. Apparatus for the disposal of flue gas from gas or liquid-fuel boiler-burner groups. 4,624,190, Cl. 110-215.000.

Capra, Thierry; and Gerard, Philippe, to Commissariat a l'Energie Atomique. Process for the production by catalysis of a layer having a high magnetic anisotropy in a ferrimagnetic garnet. 4,624,858, Cl. 427-38.000.

Caprari, Fausto, to RCA Corporation. Deep ultraviolet (DUV) flood exposure system. 4,625,120, Cl. 250-492.100.

Cargill, Inc.: *See—*
Levad, Thomas M.; and Jewell, Lisle A., 4,624,614, Cl. 414-95.000.

Carl-Zeiss-Stiftung: *See—*
Hanssen, Adalbert; and Schwarz, Jurgen, 4,624,537, Cl. 350-531.000.

Carlson, Emery J.: *See—*
Yamanis, Jean; Carlson, Emery J.; and Armor, John N., 4,624,939, Cl. 502-210.000.

Carlson, Roland W.: *See—*
Blaskis, Edward A.; and Carlson, Roland W., 4,625,324, Cl. 378-130.000.

Carolina Solvents, Inc.: *See—*
Gindrup, Wayne L.; and Vinson, Rebecca R., 4,624,798, Cl. 252-62.540.
Gindrup, Wayne L.; and Vinson, Rebecca R., 4,624,865, Cl. 427-126.200.

Caron, John D. Storing rack for core sample boxes. 4,624,373, Cl. 211-41.000.

Caron, Michel R.: *See—*
Audureau, Joel; Caron, Michel R.; and Hervais, Vincent, 4,624,823, Cl. 264-569.000.

Carr, Raymond, to Atlas Pencil Company Limited. Pigmented composition. 4,624,273, Cl. 132-88.700.

Carre, Jean-Jacques; and Cheron, Jean-Marc, to Societe Anonyme D.B.A. Safety device on a braking corrector. 4,624,507, Cl. 303-6.00C.

Carruth, John C.: *See—*
Cearley, James E.; Carruth, John C.; Dixon, Robert C.; Spencer, Stephanie S.; and Zuloaga, Jaime A., Jr., 4,624,826, Cl. 376-327.000.

Carson, Richard F., Jr.: *See—*
Lowery, Guy R.; Hilal, Said S.; Carson, Richard F., Jr.; and Pastrick, Danny L., 4,624,243, Cl. 128-6.000.

Carter, Andrew C.: *See—*
Goodfellow, Robert C.; and Carter, Andrew C., 4,625,225, Cl. 357-30.000.

Carter-Wallace, Inc.: *See—*
Sisbarro, Frederick P., 4,624,810, Cl. 264-25.000.

Cartmell, Robert R.; and Horecky, Carl J., to Standard Oil Company (Indiana). Apparatus and process for mixing cracking catalyst with a fluid hydrocarbon. 4,624,836, Cl. 422-115.000.

Cascade Corporation: *See—*
Farmer, Stanley E.; and Seaberg, Richard D., 4,624,620, Cl. 414-607.000.

Cascade Designs, Inc.: *See—*
Lea, James M.; and Haggerty, Peter D., 4,624,877, Cl. 428-71.000.

Case Western Reserve University: *See—*
Lando, Jerome B., 4,624,761, Cl. 524-80.000.

Casio Computer Co., Ltd.: *See—*
Asako, Makoto, 4,624,552, Cl. 355-55.000.
Ohno, Hiroko; and Matsumoto, Naoaki, 4,624,170, Cl. 84-1.030.
Yuzawa, Keiji; Matsumoto, Naoaki; Kayahara, Takehiko; Tateishi, Naofumi; and Fukuda, Makoto, 4,624,171, Cl. 84-1.030.

Casio Electronics Manufacturing Co., Ltd.: *See—*
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Cassells, Wayne R. Elongated sheet of material. 4,624,482, Cl. 283-62.000.

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Lazzarini, Anna M.; Scarponi, Ugo; de Castiglione, Roberto; Ceserani, Roberto; Castello, Renato; Vaghi, Fabrizio; and Toti, Daniela, 4,624,956, Cl. 514-301.000.

Castro, Horacio; and Castro, Marcelo. Method and apparatus for activating through phone telecommand an announcer-recorder, and for selectively activating through the sending of codes consisting of signals at least another automatic call attention phone device. 4,625,079, Cl. 379-77.000.

Castro, Marcelo: *See—*
Castro, Horacio; and Castro, Marcelo, 4,625,079, Cl. 379-77.000.

Catalysts & Chemicals Industries Co., Ltd.: *See—*
Sato, Goro; Ogata, Masamitsu; and Hirai, Toshiharu, 4,624,936, Cl. 502-65.000.

Catch the Wind Kite Shops, Inc.: *See—*
Waters, John R., 4,624,648, Cl. 446-176.000.

Cato, Stephen J.: *See—*
Katritzky, Alan R.; Cato, Stephen J.; Rasmussen, Jerald K.; Krepski, Larry R.; and Heilmann, Steven M., 4,624,995, Cl. 525-452.000.

Cearley, James E.; Carruth, John C.; Dixon, Robert C.; Spencer, Stephanie S.; and Zuloaga, Jaime A., Jr., to General Electric Company. Control rod velocity limiter. 4,624,826, Cl. 376-327.000.

Cecere, Andrew P.: *See*—
Diggle, Edmund A., Jr.; and Cecere, Andrew P., 4,624,036, Cl. 26-51.400.
CEFILAC: *See*—
Rogemont, Jean, 4,624,465, Cl. 277-34.000.
Celanese Corporation: *See*—
Farrow, Gerry; and Conciatori, Anthony B., 4,624,812, Cl. 264-63.000.
Giniewicz, Jayne R.; Safari, Ahmad; Newnham, Robert E.; and Cross, Leslie E., 4,624,796, Cl. 252-62.900.
Stuetz, Dagobert E., 4,624,872, Cl. 428-1.000.
Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, to Pfizer Inc. Acidic polycyclic ether antibiotic. 4,625,041, Cl. 549-343.000.
Cerkanowicz, Anthony E.; and Chimenti, Robert J. L., to Exxon Research and Engineering Company. Separation of dispersed liquid phase from continuous fluid phase. 4,624,765, Cl. 204-188.000.
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Cessna Aircraft Company, The: *See*—
Putnam, Richard C., 4,624,445, Cl. 251-63.400.
Cetus Corporation: *See*—
Larrick, James W.; Raubitschek, Andrew R.; and Truitt, Kenneth E., 4,624,921, Cl. 435-172.200.
Cgee Alsthom: *See*—
Charles, Patrick, 4,625,161, Cl. 323-210.000.
Chairman of Research Association for Biotechnology, Eiji Suzuki: *See*—
Inoue, Shigeo; Kimura, Yoshiharu; and Adachi, Shigehito, 4,624,920, Cl. 435-142.000.
Chambers, Scott W.: *See*—
Ash, Charles E.; Chambers, Scott W.; Jenkins, David R.; and Herliczek, Siegfried H., 4,624,731, Cl. 156-382.000.
Chambon, Jean-Pierre: *See*—
Biziere, Kathleen; Chambon, Jean-Pierre; and Hallot, Andre , 4,624,952, Cl. 514-252.000.
Champion, James R.; and Yeager, Clarke A., to International Business Machines Corporation. Electrostatic probe. 4,625,176, Cl. 324-458.000.
Chan, Albert L.: *See*—
Fitzpatrick, Mark E.; Tsui, Cyrus Y.; Chan, Andrew K.; and Chan, Albert L., 4,625,311, Cl. 371-15.000.
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Fitzpatrick, Mark E.; Tsui, Cyrus Y.; Chan, Andrew K.; and Chan, Albert L., 4,625,311, Cl. 371-15.000.
Chang, Chong E., to Alpha Therapeutic Corporation. Fractionation of blood plasma. 4,624,780, Cl. 210-195.100.
Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Catalytic cracking of using catalyst produced by novel process hydrocarbons. 4,624,774, Cl. 208-120.000.
Chang, Yi M.; and Fenwick, James R., to United States of America, Air Force. Liquid tank weld cavitation protection. 4,624,388, Cl. 220-435.000.
Chao, Herbert S.; and Kelsey, Donald R., to Union Carbide Corporation. Process for preparing sulfonated poly(aryl ether) resins. 4,625,000, Cl. 525-534.000.
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Marcel, Frederic E.; and Maume, Francois J. M., 4,624,339, Cl. 181-230.000.
Charles, Patrick, to Cgee Alsthom. Control pulse generator for thyristors supplying a reactive power regulating inductor in an electrical power network. 4,625,161, Cl. 323-210.000.
Cheng, Wenche W.; Stoner, Donald R.; and Keller, Harold T., deceased (by Keller, Patricia A., administratrix), to Westinghouse Electric Corp. Brazing sleeve having ceramic flux band and method for applying same. 4,624,866, Cl. 427-190.000.
Chenoweth, David V.: *See*—
McStravick, David M.; and Chenoweth, David V., 4,624,485, Cl. 285-47.000.
Cheron, Jean-Marc: *See*—
Carre, Jean-Jacques; and Cheron, Jean-Marc, 4,624,507, Cl. 303-6.00C.
Cherryholmes, John T., to Coleman Company, Inc., The. Reflector for radiant heater. 4,624,241, Cl. 126-92.00B.
Chesnauskas, Ralph J.: *See*—
Apprille, Domenic V., Jr.; Chesnauskas, Ralph J.; Jacobson, Chester F.; and Trotta, Robert A., 4,624,051, Cl. 30-50.000.
Chetty, P. R. K.; Galloway, Gary; and Thollot, Pierre, to Sundstrand Corporation. Soft-start circuit for a power converter. 4,625,271, Cl. 363-49.000.
Chevron Research Company: *See*—
Aagaard, Paul M., 4,624,318, Cl. 166-359.000.
Current, Steven P., 4,625,049, Cl. 560-232.000.
Current, Steven P., 4,625,050, Cl. 560-232.000.
Current, Steven P., 4,625,051, Cl. 560-265.000.
Haunschild, Willard M., 4,624,748, Cl. 203-29.000.
Wollenberg, Robert H., 4,624,681, Cl. 44-63.000.
Chiba, Jiro: *See*—
Kokubu, Yoshinori; and Chiba, Jiro, 4,624,934, Cl. 501-17.000.
Chida, Tsuneaki: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.
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Chimenti, Robert J. L., to Exxon Research and Engineering Company. Separation of dispersed phase from phase mixture. 4,624,763, Cl. 204-188.000.
Chimenti, Robert J. L.: *See*—
Cerkanowicz, Anthony E.; and Chimenti, Robert J. L., 4,624,765, Cl. 204-188.000.
Ching-An, Wu. Sea wave impacted power generating device. 4,625,124, Cl. 290-42.000.
Chitayat, Anwar, to Anorad. Linear motor with seal. 4,625,132, Cl. 310-13.000.
Cholnoky, Eszter: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.
Chong, Lawrence; and Tom, Ha. Multiple remote control VCR pause switch. 4,625,244, Cl. 358-335.000.
Chou, Shine K., to Monsanto Company. Process for removing surface oxides from activated carbon catalyst. 4,624,937, Cl. 502-180.000.
Christensson, Erik G.: *See*—
Bjork, Anders K.; and Christensson, Erik G., 4,624,953, Cl. 514-255.000.
Christison, S. Grant, to PACCAR Inc. Constant tension hoisting system. 4,624,450, Cl. 254-273.000.
Chronar Corp.: *See*—
Delahoy, Alan E.; Ellis, Frank B., Jr.; and Rose, Albert, 4,625,071, Cl. 136-250.000.
Chrysler Motors Corporation: *See*—
Durand, Remie P., 4,624,523, Cl. 339-176.00L.
Durand, Remie P., 4,624,524, Cl. 339-176.00L.
Hillebrand, Donald G.; and Mugford, Donald A., 4,624,493, Cl. 293-136.000.
Chrysssolouris, George M., to Massachusetts Institute of Technology. Stock removal by laser cutting. 4,625,093, Cl. 219-121.0LJ.
Chung, David: *See*—
Li, Choh H.; Chung, David; Hammonds, R. Glenn, Jr.; and Ramasharma, Kristipati, 4,624,944, Cl. 514-12.000.
Church & Dwight Co., Inc.: *See*—
Marder, Herman L.; and Lindlar, Ernest E., 4,624,366, Cl. 206-620.000.
Ciannella, Michael A.: *See*—
Gould, Arnold S.; and Ciannella, Michael A., 4,624,657, Cl. 604-103.000.
Ciba-Geigy Corporation: *See*—
Goschke, Richard, 4,624,951, Cl. 514-234.000.
Lee, Ping I., 4,624,848, Cl. 424-22.000.
Puntener, Alois, 4,625,017, Cl. 534-695.000.
Schneider, Dieter, 4,624,678, Cl. 8-526.000.
Zink, Rudolf; and Fletcher, Ian J., 4,625,027, Cl. 284-129.000.
Zweifel, Hans; Bauer, Sigrid; and Meier, Kurt, 4,624,912, Cl. 430-258.000.
Cimarusti, Christopher M.: *See*—
Floyd, David M.; Fritz, Alan W.; and Cimarusti, Christopher M., 4,625,022, Cl. 540-355.000.
Clarion Co., Ltd.: *See*—
Niitsuma, Teruo; Okamoto, Takeshi; and Minagawa, Shoichi, 4,625,184, Cl. 333-150.000.
Clark, David W.; and Jablonsky, George J., to Hospitak, Inc. Hyperbaric gas treatment device. 4,624,656, Cl. 604-23.000.
Clark, Greig J., to Amerigo Technology Limited. Modified waterflood technique for enhanced hydrocarbon recovery from argillaceous subterranean reservoirs. 4,624,314, Cl. 166-271.000.
Clark, Richard W.: *See*—
Jensen, Marten C., 4,625,206, Cl. 340-902.000.
Clark, William H., to Exxon Production Research Co. Acoustic lens for marine seismic data multiple reflection noise reduction. 4,625,302, Cl. 367-24.000.
Clausen, Glenn A.: *See*—
Lane, Philip A.; Schrader, Charles H.; Clausen, Glenn A.; and Self, David E., 4,624,771, Cl. 208-74.000.
Clausen, Robert L. Bullet casting machine. 4,624,297, Cl. 164-262.000.
Clauss, Karl: *See*—
Schmidt, Erwin; and Clauss, Karl, 4,625,024, Cl. 544-2.000.
Clemens, Donald L.: *See*—
Jordan, William D.; and Clemens, Donald L., 4,625,260, Cl. 361-386.000.
Clerc, Jean F., to Commissariat a l'Energie Atomique. Sequential control process for a matrix display. 4,625,204, Cl. 340-784.000.
Clermont, Christian; de Moncuit, Marc; and Gauckler, Jacques, to Hospal Industrie. Spacer for membrane apparatus. 4,624,778, Cl. 210-321.300.
Clextral: *See*—
Vannier, Jean; and Mourrier, Francis, 4,624,577, Cl. 366-83.000.
Clifford, Andrew W.: *See*—
Arrowsmith, David J.; and Clifford, Andrew W., 4,624,752, Cl. 204-37.600.
Coal Industry (Patents) Limited: *See*—
Mills, Peter S.; and Daly, Ivor K., 4,624,574, Cl. 366-13.000.

Coal Tech Corp.: *See—*
Zauderer, Bert; and Tilli, Vincent, 4,624,191, Cl. 110-264.000.

Cogswell, Frederic N.; and Measuria, Umakant, to Imperial Chemical Industries PLC. Reinforced fibre products. 4,624,886, Cl. 428-245.000.

Cohen, Edward, to RCA Corporation. Method for detecting blemishes contiguous to the perimeter of a CCD image. 4,625,237, Cl. 358-106.000.

Cohrs, Richard B.: *See—*
Hoffman, Herbert W.; Cohrs, Richard B.; and Dye, William P., 4,624,120, Cl. 70-380.000.

Cole, Herbert S.: *See—*
Aftergut, Sigfried; and Cole, Herbert S., 4,624,532, Cl. 350-349.000.

Cole, Paul M., to Du Pont de Nemours, E. I., and Company. Restoring cap assembly for a centrifuge rotor having a flexible carrier. 4,624,655, Cl. 494-20.000.

Coleman Company, Inc., The: *See—*
Cherryholmes, John T., 4,624,241, Cl. 126-92.00B.

Colgate-Palmolive Company: *See—*
Muller, Ernest G., 4,624,868, Cl. 427-384.000.

Collins, Robert C., to Berwind Corporation. Capacitance-type material level indicator. 4,624,139, Cl. 73-304.00C.

Combustion Engineering, Inc.: *See—*
Byeseda, John J., 4,624,704, Cl. 75-101.0BE.
Hayes, James K., 4,624,304, Cl. 165-162.000.

Commissariat a l'Energie Atomique: *See—*
Capra, Thierry; and Gerard, Philippe, 4,624,858, Cl. 427-38.000.
Clerc, Jean F., 4,625,204, Cl. 340-784.000.
Hartmann, Jool, 4,624,864, Cl. 427-89.000.

Commonwealth Aluminum Corporation: *See—*
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,624,766, Cl. 204-294.000.

Compagnie Francaise d'Articles de Sport: *See—*
Delery, Marc, 4,624,063, Cl. 36-117.000.

Compagnie Francaise des Petroles: *See—*
Vidal, Jean E.; and Serio, Andre L., 4,624,281, Cl. 137-599.200.

Compagnie Industrielle d'Applications Thermiques C.I.A.T.: *See—*
Bridier, Robert, 4,624,122, Cl. 72-70.000.

Compagnie Industrielle de Mecanismes en abrege C.I.M.: *See—*
Vincent, Bernard, 4,624,491, Cl. 292-201.000.

Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., to Automotive Products plc. Prefilled hydraulic control apparatus for motor vehicle. 4,624,290, Cl. 141-1.000.

Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., to Automotive Products plc. Method of prefilling modular hydraulic control apparatus. 4,624,291, Cl. 141-1.000.

Conciatori, Anthony B.: *See—*
Farrow, Gerry; and Conciatori, Anthony B., 4,624,812, Cl. 264-63.000.

Connell, Brian P.: *See—*
Brooks, Ralf M.; and Connell, Brian P., 4,625,216, Cl. 346-76.0PH.

Conrad, Peter G., to Sobstad Sailmakers, Inc. Method of stress distribution in a sail, a sail embodying the same and sail construction. 4,624,205, Cl. 114-103.000.

Conrath, James L.: *See—*
Singer, Paul A.; and Conrath, James L., 4,625,332, Cl. 455-67.000.

Consortium fur elektrochemische Industrie GmbH: *See—*
Gebauer, Helmut, 4,625,046, Cl. 558-388.000.

Conway, Larry J.; and Cornish, William D., to Canada, Her Majesty the Queen in Right of. Complex microwave signal generator. 4,625,177, Cl. 328-187.000.

Cooke, Arthur V.: *See—*
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,624,766, Cl. 204-294.000.

Cooke, David J.; Griffiths, Brian J.; John, Vivian B.; and Sawicki, George C., to Dow Corning, Ltd,. Compositions and process for treating textiles. 4,624,794, Cl. 252-8.800.

Cooney, Daniel E.; and Miller, Russell D., to Lear Fan Corp. (U.S.). Aircraft engine mount. 4,624,436, Cl. 248-555.000.

Cooper, Glenn D.: *See—*
Axelrod, Robert J.; and Cooper, Glenn D., 4,624,979, Cl. 524-140.000.

Cooper Industries, Inc.: *See—*
Cox, Albert R., 4,625,074, Cl. 174-117.00F.
Hurley, James R., 4,625,283, Cl. 364-487.000.
Lazar, Lawrence W.; and Wainio, Ronald A., 4,625,189, Cl. 335-10.000.

Cooperrider, Myron T.: *See—*
Baggott, George T.; and Cooperrider, Myron T., 4,624,301, Cl. 165-47.000.

Corning Glass Works: *See—*
Beall, George H.; Doman, Robert C.; and Pinckney, Linda R., 4,624,933, Cl. 501-3.000.

Cornish, William D.: *See—*
Conway, Larry J.; and Cornish, William D., 4,625,177, Cl. 328-187.000.

Corsette, Douglas F. Trigger type sprayer. 4,624,413, Cl. 239-333.000.

Cortese, Richard: *See—*
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,624,945, Cl. 514-30.000.

Coshow, Chester L. Well tool dislodgement apparatus. 4,624,313, Cl. 166-241.000.

Couch, Robert P., to United Technologies Corporation. Sectional distress isolating electrostatic engine diagnostics. 4,625,280, Cl. 364-431.020.

Cox, Albert R., to Cooper Industries, Inc. Mass terminable flat cable. 4,625,074, Cl. 174-117.00F.

Cox, Dennis R.: *See—*
Pottinger, John S.; Turner, Andrew D.; Bowen, William R.; and Cox, Dennis R., 4,624,760, Cl. 204-141.500.

Cragoe, Edward J., Jr.; Pietruszkiewicz, Adolph M.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Substituted (2,3-dihydro-4-(3-oxo-1-cyclohexen-1-yl)phenoxy) alkanoic acids, their derivatives and their salts. 4,625,047, Cl. 560-53.000.

Cramb, Alan W.; and Byrne, Michael, to Bethlehem Steel Corporation. Continuous casting slag. 4,624,707, Cl. 75-257.000.

Crane, Dale E.: *See—*
Kolb, William P.; and Crane, Dale E., 4,625,317, Cl. 372-88.000.

Crathern Engineering Co., Inc.: *See—*
Porat, Thomas M., 4,624,456, Cl. 271-103.000.

Creedon, Richard L.; and Howanick, John J., to GA Technologies Inc. Rail gun barrel assembly. 4,624,173, Cl. 89-8.000.

Crescent Metal Products, Inc.: *See—*
Baggott, George T.; and Cooperrider, Myron T., 4,624,301, Cl. 165-47.000.

Creusot-Loire: *See—*
Katz, Maurice, 4,624,346, Cl. 188-282.000.
Pere, Gerard, 4,624,687, Cl. 55-206.000.

Critikon, Inc.: *See—*
Danby, Hal C.; and Ritson, Carl, 4,624,663, Cl. 604-250.000.

Croney, David J.: *See—*
Weeks, Ronald D.; and Croney, David J., 4,625,261, Cl. 361-433.000.

Cross, Leslie E.: *See—*
Giniewicz, Jayne R.; Safari, Ahmad; Newnham, Robert E.; and Cross, Leslie E., 4,624,796, Cl. 252-62.900.

Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, to AT&T Technologies Inc.; and AT&T Bell Laboratories. Fraud prevention in an electronic coin telephone set. 4,625,078, Cl. 379-145.000.

Crown Creative Industries: *See—*
Payne, William J., 4,625,268, Cl. 362-352.000.

Cselt-Centro Studi Laboratori Telecommunicazioni SpA: *See—*
Roba, Giacomo, 4,624,692, Cl. 65-1.000.

Cullen, Walter P.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, 4,625,041, Cl. 549-343.000.

Curatolo, Barbara D.: *See—*
Weinert, Raymond J., Jr.; Benton, Kenneth C.; Desmond, Michael J.; Ball, Lawrence E.; and Curatolo, Barbara D., 4,625,002, Cl. 526-90.000.

Curcio, Maria: *See—*
Arru, Pietro; Bona, Gioacchino; Curcio, Maria; and Vallana, Franco, 4,624,822, Cl. 264-544.000.

Curnutt, Gerald L., to Dow Chemical Company, The. Process of preparing dihydrocarbyl carbonates using a nitrogen-containing coordination compound supported on activated carbon. 4,625,044, Cl. 558-277.000.

Current, Steven P., to Chevron Research Company. Alcohol carbonylation process using a bimetallic nickel catalyst. 4,625,049, Cl. 560-232.000.

Current, Steven P., to Chevron Research Company. Ether homologation to esters and alcohols using a heterogeneous sulfided catalyst. 4,625,050, Cl. 560-232.000.

Current, Steven P., to Chevron Research Company. Carboxylic acid ester homologation using a sulfided cobalt catalyst. 4,625,051, Cl. 560-265.000.

Custom Machinery Design, Inc.: *See—*
Gietman, Peter J., Jr., 4,624,095, Cl. 53-117.000.

Cyonics, Ltd.: *See—*
Kolb, William P.; and Crane, Dale E., 4,625,317, Cl. 372-88.000.

Cyphers, Norman A.: *See—*
Kieffer, Joseph W.; and Cyphers, Norman A., 4,624,602, Cl. 404-94.000.

D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy: *See—*
el Din Nasser, Gamal, 4,624,747, Cl. 203-11.000.

Dach, Michael M., to Texaco Inc. Quench ring and dip tube combination with improvement. 4,624,683, Cl. 48-69.000.

Dahlberg, Kjell A. M.; and Valtakari, Urho V., to Oy Partek AB. Procedure for classifying a crystal mixture or concentrating rocks or mixed crystals in particle form. 4,624,416, Cl. 241-1.000.

Dahlgren, Robert P., to Magnetic Peripherals Inc. Calibration standards for flying height testers. 4,624,564, Cl. 356-243.000.

Dahms, Wolfgang, to Schering Aktiengesellschaft. Method for automatic control of galvanic deposition of copper coatings in galvanic acid copper baths. 4,624,857, Cl. 427-8.000.

Daicel Chemical Industries, Ltd.: *See—*
Fujiwa, Takaaki; and Kojima, Hidetaka, 4,625,058, Cl. 562-519.000.

Daig Corporation: *See—*
Kane, Lawrence M., 4,624,266, Cl. 128-785.000.

Daimler-Benz Aktiengesellschaft: *See—*
Klak, Roland; and Buchner, Olaf, 4,624,226, Cl. 123-179.00H.
Kraft, Karl-Friedrich; and Merkle, Hans, 4,624,154, Cl. 74-695.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Yamada, Mitsuhiko, 4,625,234, Cl. 358-78.000.

Daiwa Steel Tube Industries Co., Ltd.: *See—*
Nakamura, Matsuichi, 4,624,489, Cl. 285-382.000.

Daly, Ivor K.: *See*—
Mills, Peter S.; and Daly, Ivor K., 4,624,574, Cl. 366-13.000.

Dana Corporation: *See*—
Yarnell, James A., 4,624,352, Cl. 192-53.00E.

Dana-Farber Cancer Institute, Inc.: *See*—
Senter, Peter D.; Lambert, John M.; and Blattler, Walter A., 4,625,014, Cl. 530-300.000.

Danby, Hal C.; and Ritson, Carl, to Critikon, Inc. Pinch valve assembly. 4,624,663, Cl. 604-250.000.

Daniele, Joseph J., to Xerox Corporation. Method of fabricating electro-mechanical modulator arrays. 4,624,741, Cl. 156-645.000.

Danielsson, Mats, to Santrade Ltd. Saw. 4,624,053, Cl. 30-166.00R.

Danner, Gary A.; and Sherman, Raymond W., to General Kinematics Corporation. Vibratory separation apparatus. 4,624,370, Cl. 209-631.000.

Danno, Yuji; and Kawashima, Kouzou, to Kabushiki Kaisha Toshiba. Metal vapor discharge lamp including an inner burner having tapered ends. 4,625,149, Cl. 313-623.000.

Dardi, Louis E.: *See*—
Smickley, Robert J.; and Dardi, Louis E., 4,624,714, Cl. 148-3.000.

Das, K. Bhagwan, to Boeing Company, The. Method of welding metal matrix composites. 4,625,095, Cl. 219-137.0WM.

Dashley, Frederick J.: *See*—
Baker, Richard R.; Dashley, Frederick J.; McCormack, Anthony D.; and Greig, Colin C., 4,624,268, Cl. 131-332.000.

Data General Corporation: *See*—
Banks, Edwin R., 4,625,294, Cl. 364-900.000.

David Clark Company Incorporated: *See*—
Poole, Forrest R.; and Hansen, David G., 4,624,248, Cl. 128-89.00R.

Davis, Charles P.; and Outenreath, Robert, to Board of Regents, The University of Texas System. Microcentrifugation tube for the concentration of samples for electron microscopy. 4,624,835, Cl. 422-102.000.

Davis, Gary C., to General Electric Company. Method of making integrated circuit silicon die composite having hot melt adhesive on its silicon base. 4,624,724, Cl. 156-264.000.

Davis, Randy C.: *See*—
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Pearce, Christopher; Lynch, Michel A.; and Davis, Richard K., 4,625,277, Cl. 364-416.000.

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Foster, Randy C., 4,624,652, Cl. 474-135.000.
Long, Delmar D., 4,624,813, Cl. 264-137.000.

Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., to Exxon Research & Engineering Company. Non-catalytic method for reducing the concentration of NO in combustion effluents by injection of ammonia at temperatures greater than about 1300° K. 4,624,840, Cl. 423-235.000.

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Deere & Company: *See*—
Lowe, Terry L.; and Long, John D., 4,624,322, Cl. 172-620.000.

De Graaf, Henry J., to SCM Corporation. Alkyd resin cure modifiers. 4,624,869, Cl. 427-385.500.

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Heidsiek, Horst; Jackel, Gernot; and Becker, Horst, 4,624,832, Cl. 420-442.000.

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Tan, Sing L.; van de Polder, Leendert J.; De Haan, Gerard; and Vreeswijk, Franciscus W. P., 4,625,230, Cl. 358-11.000.

De Jong, Hugo; and Thijs, Hugo, to Teepak, Inc. End-dressing for tubular casings. 4,624,873, Cl. 428-36.000.

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Andrieux, Bernard; Bourven, Elisabeth; and Martin, Roger, 4,624,686, Cl. 55-196.000.

Delatorre, Leroy C.; and Wilson, Homer M., to Panex Corporation. Down hole power conversion means for fully utilizing batteries. 4,624,136, Cl. 73-152.000.

Delery, Marc, to Compagnie Francaise d'Articles de Sport. Ski boot with serrated clamping strap. 4,624,063, Cl. 36-117.000.

DelliColli, Humbert T., to Westvaco Corporation. Seed treatment method with aqueous suspension of alkali lignin. 4,624,694, Cl. 71-77.000.

Delwiche, John L. Flow regulating device. 4,624,278, Cl. 137-172.000.

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Clermont, Christian; de Moncuit, Marc; and Gauckler, Jacques, 4,624,778, Cl. 210-321.300.

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DeNoble, Victor: *See*—
Jirkovsky, Ivo; King, Gary; Baudy, Reinhardt; and DeNoble, Victor, 4,624,954, Cl. 514-290.000.

DePirro, Mario. Automatic gate valve shut-off device. 4,624,280, Cl. 137-392.000.

Derdyk, Flavio, to Plasticos Polyfilm S/A. Packaging arrangement for plastic bags. 4,624,365, Cl. 206-554.000.

DeRossett, Edmund Z.; and Gentzel, Frederick F., to Personal Products Company. Channeled napkin with dry cover. 4,624,666, Cl. 604-366.000.

Desai, Rohit M.: *See*—
Neiss, Edward S.; Desai, Rohit M.; and Youssefyeh, Raymond D., 4,625,034, Cl. 546-152.000.

Desmond, Michael J.: *See*—
Weinert, Raymond J., Jr.; Benton, Kenneth C.; Desmond, Michael J.; Ball, Lawrence E.; and Curatolo, Barbara D., 4,625,002, Cl. 526-90.000.

DeSoto, Inc.: *See*—
Ansel, Robert E., 4,624,994, Cl. 525-440.000.

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Wan, Chung-Zong; and Dettling, Joseph C., 4,624,940, Cl. 502-251.000.

Deutsch, Robert W., to Motorola, Inc. Engine load transient compensation system. 4,625,281, Cl. 364-431.030.

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Schutze, Rainer, 4,624,874, Cl. 428-36.000.

Devon, Thomas J.: *See*—
Banda, Lionel A.; and Devon, Thomas J., 4,624,582, Cl. 374-181.000.

Dhein, Rolf: *See*—
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,624,981, Cl. 524-326.000.

Dick, Scott M.; and Patterson, Edward F., to Wehr Corporation. Fluid particle sensor. 4,624,567, Cl. 356-335.000.

Dickinson, Eric M., to Union Carbide Corporation. Process for the production of premium coke from pyrolysis tar. 4,624,775, Cl. 208-131.000.

Dickson, Rennie L.; and Smith, Roddie R., to Otis Engineering Corporation. Subsurface safety valve with lock-open system. 4,624,315, Cl. 166-323.000.

Diemoulders Proprietary Limited: *See*—
Malpas, Jon H.; and Calder, Alan R., 4,624,392, Cl. 222-83.000.

Dietenberger, Josef: *See*—
Sailer, Hubert; Ehrlinger, Friedrich J.; and Dietenberger, Josef, 4,624,353, Cl. 192-70.120.

Dietz, Wolfgang F. W., to RCA Corporation. Resonant switching apparatus using a cascode arrangement. 4,625,155, Cl. 315-408.000.

Diffrient, Niels, to Hauserman, Inc. Screen system for offices and method of making and installing same. 4,624,083, Cl. 52-65.000.

Diggle, Edmund A., Jr.; and Cecere, Andrew P., to Samcoe Holding Corporation. Automatic orientation guide for tubular knitted fabric. 4,624,036, Cl. 26-51.400.

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DiNitto, Robert S.; Porcher, Thomas C.; Eng, John W.; Namias, Charles S.; and Hughes, David B., 4,625,203, Cl. 340-750.000.

Dillman, Bruce A., to Bituma Construction Equipment Company. Adjustment of drum mixer trunnions. 4,624,576, Cl. 366-63.000.

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Zuber, Pierre A.; May, Norman W.; DiSilvestro, Robert J.; and Rhoton, Richard S., 4,625,279, Cl. 364-426.000.

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Silberman, Ira J.; and Hill, William J., 4,624,457, Cl. 272-118.000.

Dixon, Robert C.: *See*—
Cearley, James E.; Carruth, John C.; Dixon, Robert C.; Spencer, Stephanie S.; and Zuloaga, Jaime A., Jr., 4,624,826, Cl. 376-327.000.

Dr. Ing. h.c.F., Porsche Aktiengesellschaft: *See*—
Stotz, Erich; and Horn, Reinhard, 4,624,152, Cl. 74-518.000.

Doddington, George R.: *See*—
Papamichalis, Panos E.; and Doddington, George R., 4,625,286, Cl. 364-513.500.

DODUCO K.G. Dr. Eugen Durrwachter: *See*—
Berndt, Malte; and Ksinsik, Dieter, 4,624,941, Cl. 502-302.000.

Doering, Charles W., to Brinly-Hardy Co., Inc. Gravity spreader. 4,624,195, Cl. 111-12.000.

Dolan, Donald G. Device for holding a sheet or cover in position on the surface of a water bed mattress. 4,624,022, Cl. 5-508.000.

Doman, Robert C.: *See*—
Beall, George H.; Doman, Robert C.; and Pinckney, Linda R., 4,624,933, Cl. 501-3.000.

Don Bur (Bodies & Trailers) Limited: *See*—
Shuttleworth, Kevin P., 4,624,074, Cl. 49-222.000.

Donaldson, Ann L.: *See*—
Lotito, Lawrence A.; Huxford, Teresa D.; and Donaldson, Ann L., 4,625,081, Cl. 379-88.000.

Dooley, Ray A., to Babcock & Wilcox Company, The. Reactor vessel sealing plug. 4,624,824, Cl. 376-204.000.
Dorfman, Leonard M., to Timex Corporation. Liquid crystal display with central interconnections. 4,624,529, Cl. 350-334.000.
Dorman, Dennis J.: *See*—
Holm, Albert E.; and Dorman, Dennis J., 4,624,131, Cl. 73-46.000.
Dormoy, Jean-Robert; and Heymes, Alain, to Sanofi. Process for preparing 5-aza-indole and intermediates used in this process. 4,625,033, Cl. 546-113.000.
Doshi, Pratap K.; and Wilson, John F., to Westinghouse Electric Corp. Nuclear reactor control rod having a reduced worth tip. 4,624,827, Cl. 376-333.000.
Doto, Shigeaki, to Nippon Air Brake Co., Ltd. Compound electropneumatic brake control system. 4,624,506, Cl. 303-3.000.
Dow Chemical Company, The: *See*—
Au, Andrew T., 4,625,045, Cl. 558-345.000.
Curnutt, Gerald L., 4,625,044, Cl. 558-277.000.
Lysenko, Zenon; and Bancroft, Eric E., 4,624,757, Cl. 204-78.000.
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Mills, Richard P., 4,624,332, Cl. 177-224.000.
Nace, Vaughn M., 4,624,972, Cl. 523-136.000.
Pham, Ha Q., 4,624,975, Cl. 523-453.000.
Treptow, Warren L.; Park, Chung P.; and Hyun, Kun S., 4,624,969, Cl. 521-60.000.
Weber, Christian A.; and Paige, William P., 4,624,986, Cl. 525-67.000.
Werner, John A., 4,625,035, Cl. 546-345.000.
Wolcott, Richard A.; Pearce, Roscoe L.; and Pauley, Charles R., 4,624,839, Cl. 423-228.000.
Dow Corning Corporation: *See*—
Haluska, Loren A.; and Molzahn, Marcelle A., 4,625,031, Cl. 546-14.000.
Keil, Joseph W., 4,624,998, Cl. 525-476.000.
Kosal, Diane M.; and Maxson, Myron T., 4,625,011, Cl. 528-14.000.
Dow Corning, Ltd.: *See*—
Cooke, David J.; Griffiths, Brian J.; John, Vivian B.; and Sawicki, George C., 4,624,794, Cl. 252-8.800.
White, James W.; Westall, Stephen; and Griffiths, Brian J., 4,624,676, Cl. 8-115.560.
Dragerwerk Aktiengesellschaft: *See*—
Holscher, Uvo, 4,624,261, Cl. 128-635.000.
Drake, Denny. Minimum tillage toolbar and method for using same. 4,624,197, Cl. 111-52.000.
Dreisin, Ilya. Stuffing machine for food products. 4,624,030, Cl. 17-33.000.
Dresser Industries, Inc.: *See*—
Heitman, Theodore A., 4,624,500, Cl. 296-146.000.
Driscoll, Barry J.: *See*—
Weber, Robert E.; Wakeman, Russell J.; and Driscoll, Barry J., 4,624,145, Cl. 73-861.310.
Drori, Mordeki. Easily-cleanable filters. 4,624,785, Cl. 210-414.000.
Drummond Scientific Company: *See*—
Kenney, James W., 4,624,147, Cl. 73-864.150.
Dual Fuel Systems, Inc.: *See*—
Palmer, Stephen W.; and Gneiding, Donald R., 4,624,390, Cl. 222-3.000.
Duffy, John W.; Bonzer, William J.; Scott, Gary L.; Sickels, Dennis G.; and Zeigler, Ralph W. Control regulator having a rolling diaphragm. 4,624,442, Cl. 251-61.100.
Dujari, Shyam: *See*—
Tinker, Darrell E.; and Dujari, Shyam, 4,625,126, Cl. 307-262.000.
Dullemond, Dirk J.: *See*—
Kasperkovitz, Wolfdietrich G.; and Dullemond, Dirk J., 4,625,131, Cl. 307-540.000.
Dumdie, Dan P.: *See*—
Sande, Walter E.; Stroud, Barrie D.; and Dumdie, Dan P., 4,624,745, Cl. 162-252.000.
Dunker, Friedrich W., to Fricker, Siegfried. Tie anchor for reinforced sandwich panels. 4,624,089, Cl. 52-410.000.
Dunphy, Gerald F.: *See*—
Newman, Donald J.; and Dunphy, Gerald F., 4,624,119, Cl. 70-366.000.
Duphar International Research B.V.: *See*—
Mijers, Jan. W. M.; and van der Wal, Gillis P., 4,624,660, Cl. 604-136.000.
Du Pont de Nemours, E. I., and Company: *See*—
Bell, John H., Jr., 4,624,102, Cl. 57-296.000.
Cole, Paul M., 4,624,655, Cl. 494-20.000.
Fritschel, Scott J.; and Saunders, William D., 4,624,988, Cl. 525-151.000.
Sipio, William J., 4,624,964, Cl. 514-539.000.
Durand, Remie P., to Chrysler Motors Corporation. Cantilevered redundant terminal. 4,624,523, Cl. 339-176.00L.
Durand, Remie P., to Chrysler Motors Corporation. Base redundant terminal. 4,624,524, Cl. 339-176.00L.
Durckheimer, Walter, to Hoechst Aktiengesellschaft. Crystalline modification of ceftazidim. 4,624,948, Cl. 514-206.000.
Dustoor, Manek R.: *See*—
Alber, Norman E.; Dustoor, Manek R.; Hellier, Edward K.; and Scotese, Vito N., 4,624,860, Cl. 427-46.000.
Duwel, Edward C.: *See*—
Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward C., 4,625,282, Cl. 364-466.000.
Dwyer, Frank J.; and Zwolinski, Leon M., to Allied Corporation. Foaming system for rigid urethane and isocyanurate foams based on polyethers and aromatic polyester polyols. 4,624,970, Cl. 521-131.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Buchler, Wilhelm, 4,624,440, Cl. 249-194.000.
Dye, William P.: *See*—
Hoffman, Herbert W.; Cohrs, Richard B.; and Dye, William P., 4,624,120, Cl. 70-380.000.
Dyer, Paul N.; Nordquist, Andrew F.; and Pierantozzi, Ronald, to Air Products and Chemicals, Inc. Iron on mixed zirconia-titania substrate Fischer-Tropsch catalyst and method of making same. 4,624,942, Cl. 502-330.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Bernhardt, Gunther; and Hanisch, Horst, 4,625,006, Cl. 526-279.000.
Dynatech Precision Sampling Corporation: *See*—
Averette, Julius P., 4,624,148, Cl. 73-864.210.
E. R. Squibb & Sons, Inc.: *See*—
Floyd, David M.; Fritz, Alan W.; and Cimarusti, Christopher M., 4,625,022, Cl. 540-355.000.
Thottathil, John K., 4,625,038, Cl. 548-570.000.
E. T. Plasma, Inc.: *See*—
Westfall, Raymond T.; and Feldl, Erich J., 4,624,738, Cl. 156-643.000.
Eastman Kodak Company: *See*—
Simons, Michael J., 4,624,903, Cl. 430-14.000.
Eastmond, Bruce C.: *See*—
Richardson, Julian H.; and Eastmond, Bruce C., 4,625,331, Cl. 455-35.000.
Eaton Corporation: *See*—
Bartolomeo, Mark E., 4,624,568, Cl. 356-347.000.
Kelledes, William L.; and O'Neil, Walter K., 4,624,334, Cl. 180-79.100.
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,624,533, Cl. 350-354.000.
Eberhart, Walter. Battery and bulb tester. 4,625,174, Cl. 324-426.000.
Echols, Ralph H.; Patel, Bhanubhai H.; and Renfroe, James B., Jr., to Otis Engineering Corporation. Well apparatus. 4,624,310, Cl. 166-106.000.
Eckendorff, Jean P. Device for adjusting the angular position of a driving member coupled to another driven member adapted to be rotatingly driven. 4,624,596, Cl. 403-4.000.
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., to ALZA Corporation. Dispensing system with means for increasing delivery of beneficial agent from the system. 4,624,945, Cl. 514-30.000.
Eckert, Alton B.: *See*—
Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward C., 4,625,282, Cl. 364-466.000.
Economics Laboratory, Inc.: *See*—
Morganson, Stephen A.; and Schneeman, Erin P., 4,624,713, Cl. 134-25.200.
Eddy, William C., to Allied Corporation. Electro/pneumatic power steering system. 4,624,336, Cl. 180-142.000.
Edwards, Bryant, to Illinois Tool Works Inc. Multi-packaging devices, methods and machines. 4,624,363, Cl. 206-150.000.
Edwards, Gary L. Saw guide having pivotal protractor means. 4,624,054, Cl. 30-374.000.
Eeco, Inc.: *See*—
Yablonski, Robert E.; and Roe, John A., 4,625,240, Cl. 358-143.000.
Egashira, Nobumasa: *See*—
Shikama, Shinsuke; Kondou, Mitsushige; Egashira, Nobumasa; and Okada, Kazuo, 4,625,303, Cl. 369-45.000.
Ehmke, Richard D. Ladder caddy. 4,624,430, Cl. 248-211.000.
Ehrlich, Robert: *See*—
Shafer, John L.; and Ehrlich, Robert, 4,624,367, Cl. 209-577.000.
Ehrlinger, Friedrich J.: *See*—
Sailer, Hubert; Ehrlinger, Friedrich J.; and Dietenberger, Josef, 4,624,353, Cl. 192-70.120.
Eickmann, Karl. Multiple stroke radial piston machine having plural banks of cylinders and fluid pressure pockets on the pistons. 4,624,174, Cl. 91-485.000.
Eidsmore, Paul G., to Integrated Flow Systems, Inc. Fluid-flow control valve. 4,624,443, Cl. 251-65.000.
Eilers, George J.: *See*—
Krabacher, Albert C.; and Eilers, George J., 4,624,235, Cl. 128-652.000.
Eisai Co., Ltd.: *See*—
Yamamoto, Masaichi; Araki, Seiichi; Yamamoto, Hiroshi; Yamatsu, Isao; Suzuki, Takeshi; Kajiwara, Akiharu; Suzuki, Yoshikazu; and Arai, Haruyoshi, 4,624,966, Cl. 514-724.000.
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Bischoff, Albrecht; Eisentraut, Holger; and Schmidt, Joachim, 4,625,228, Cl. 357-70.000.
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Kim, Kap S.; Tisdale, William R. H.; Andrews, Bruce S.; Nash, T. Randolph; Kolodgie, Kathleen J.; and Eiserike, Steven S., 4,625,308, Cl. 370-104.000.
Eisner, Kimberly P.: *See*—
Berman, Elliot; and Eisner, Kimberly P., 4,625,070, Cl. 136-249.000.
Ekchian, Jack A.; Hoffman, Robert W.; and Ekchian, Leon, to Optima Systems, Inc. Liquid medium capacitive displacement sensor. 4,624,140, Cl. 73-304.00C.
Ekchian, Leon: *See*—
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Elbe, Hans-Ludwig, to Bayer Aktiengesellschaft. Substituted acetyleneketones. 4,625,066, Cl. 568-308.000.

el Din Nasser, Gamal, to D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy. Process for the distillation of fresh water from sea water. 4,624,747, Cl. 203-11.000.

Electro-Voice, Incorporated: *See*—
Ewald, Gary T., 4,624,338, Cl. 181-148.000.

Ellis, Alfred G., to Imperial Chemical Industries PLC. Apparatus comprising a perforated drum. 4,624,212, Cl. 118-19.000.

Ellis, Edward J.; and Ellis, Jeanne Y., to Polymer Technology Corporation. Silicone-containing contact lens material and contact lenses made thereof. 4,625,007, Cl. 526-279.000.

Ellis, Frank B., Jr.: *See*—
Delahoy, Alan E.; Ellis, Frank B., Jr.; and Rose, Albert, 4,625,071, Cl. 136-250.000.

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Ellis, Edward J.; and Ellis, Jeanne Y., 4,625,007, Cl. 526-279.000.

Eloph, Harry E., Jr.: *See*—
Hessler, John D.; and Eloph, Harry E., Jr., 4,624,718, Cl. 156-56.000.

Emerson, John D., to United States of America, Army. Missile ballast assembly. 4,624,185, Cl. 102-293.000.

Emhart Industries, Inc.: *See*—
Miller, Theodore H., 4,624,490, Cl. 292-92.000.
Weaver, Robert F., 4,625,134, Cl. 310-83.000.

Endo, Akira, to Kabushiki Kaisha Yakult Honsha. Novel collagenase "discolysin" and production method thereof. 4,624,924, Cl. 435-220.000.

Endo, Makoto; Ono, Satoshi; Toda, Takao; Kashiwagi, Kazuo; Yanagi, Masaaki; and Saito, Yoshihiro, to Canon Kabushiki Kaisha. Image forming apparatus. 4,624,547, Cl. 355-14.00E.

Energy Conversion Devices, Inc.: *See*—
Yang, Chi C.; Mohr, Ralph; Hudgens, Stephen; Johncock, Annette; and Nath, Prem, 4,624,862, Cl. 427-74.000.

Enertec: *See*—
Merle, Jean-Pierre, 4,624,399, Cl. 226-181.000.

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Frisch, Herbert, 4,625,139, Cl. 310-330.000.

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DiNitto, Robert S.; Porcher, Thomas C.; Eng, John W.; Namias, Charles S.; and Hughes, David B., 4,625,203, Cl. 340-750.000.

Engelhard Corporation: *See*—
Wan, Chung-Zong; and Dettling, Joseph C., 4,624,940, Cl. 502-251.000.

Environmental Design, Inc.: *See*—
Wagner, Louis E.; Flannery, Harold F.; and Rakoczynski, Randolph W., 4,624,604, Cl. 405-128.000.

Envirotech Corporation: *See*—
Black, Brent C.; Bradley, Bruce D.; and Haymore, Ralph B., 4,624,783, Cl. 210-271.000.
Haymore, Ralph B.; and Winter, Heinz W., 4,624,787, Cl. 210-531.000.

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Miyabayashi, Toshio; Sakabe, Nobuyuki; Udagawa, Yoshiyuki; Enyo, Hiroji; and Takemura, Yasuhiko, 4,625,005, Cl. 526-273.000.

Epworth, Richard E., to International Standard Electric Corporation. Multiplexing of optical signals. 4,625,305, Cl. 370-1.000.

Eriksson, Gunnar: *See*—
Astrom, Jan; and Eriksson, Gunnar, 4,624,340, Cl. 182-2.000.

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Stuart, Clifton F.; and Eskridge, Harold E., 4,624,472, Cl. 280-420.000.

Esposito, Christopher, to Four Seasons Solar Product Corp. Structural element especially suitable for solar greenhouses and the like and particularly utilizable for controlled shading. 4,624,084, Cl. 52-173.00R.

Essex Group, Inc.: *See*—
Hessler, John D.; and Eloph, Harry E., Jr., 4,624,718, Cl. 156-56.000.

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Rizk, Sidky D.; and Hsieh, Harry W. S., 4,624,996, Cl. 525-453.000.
Rizk, Sidky D.; and Hsieh, Harry W. S., 4,625,012, Cl. 528-28.000.

ETA S.A., Fabriques d'Ebauches: *See*—
Mock, Elmar; and Bron, Alphonse, 4,624,581, Cl. 368-282.000.

Euliss, Melvin C.: *See*—
Safrit, Sam C.; Farrell, Roscoe M.; and Euliss, Melvin C., 4,624,115, Cl. 66-172.00R.

Evans, Robert D.; and Blezard, Robert C. Weatherstripping produced by tufting with flattened knuckles. 4,624,878, Cl. 428-95.000.

Evans, Robert F.; and Davis, Randy C., to Varel Manufacturing Company. Rotating cutter drill set. 4,624,329, Cl. 175-374.000.

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Rockwood, Alyn P., 4,625,289, Cl. 364-522.000.

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Ewald, Gary T., to Electro-Voice, Incorporated. Loudspeaker enclosure for a vibrating diaphragm loudspeaker. 4,624,338, Cl. 181-148.000.

Ex-Cell-O Corporation: *See*—
Gile, Richard H.; and Bourgoine, Edward C., 4,624,236, Cl. 125-11.00R.

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McCall, Danny, 4,624,242, Cl. 126-427.000.

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Young, David A., 4,625,068, Cl. 568-454.000.

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Vora, Madhukar B., 4,624,863, Cl. 427-84.000.

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Fay, John M., to Hull Corporation. Processing cabinet with sub-door access. 4,624,512, Cl. 312-292.000.

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Gassner, Theo; and Fehr, Rolf, 4,624,401, Cl. 227-125.000.

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Westfall, Raymond T.; and Feldl, Erich J., 4,624,738, Cl. 156-643.000.

Fendrik, Steven I. Self-adjusting foot holding structure for a tiltable body exerciser. 4,624,458, Cl. 272-145.000.

Fenne, Ivor, to Lucas Industries public limited company. Fuel injection pumping apparatus. 4,624,231, Cl. 123-450.000.

Fenwick, James R.: *See*—
Chang, Yi M.; and Fenwick, James R., 4,624,388, Cl. 220-435.000.

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Ferguson, R. Stirling. Batten structure for a wing sail. 4,624,203, Cl. 114-39.000.

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Ferrara, Angelo N. Vertebrae demonstration apparatus. 4,624,642, Cl. 434-274.000.
Ferrazza, Gerald, to Spraying Systems Co. Deflector type spray nozzle for fire protection and other systems. 4,624,414, Cl. 239-467.000.
Ferriss, Jon S. Method for improving bubble surface area exposure. 4,624,791, Cl. 210-704.000.
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Kim, Chang J.; and Fiato, Rocco A., 4,624,968, Cl. 518-707.000.
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Fischer, Thomas: *See—*
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Fischer, Wolfgang; and Kniege, Wilfried, to Bayer Aktiengesellschaft. Adhesives which contain acrylic acid derivatives of 5,6-dihydrodicyclopentadienol. 4,625,008, Cl. 526-283.000.
Fisher, William S., to Cannon Mills Company. Apparatus and method for forming a double-folded wide hem in cut textile articles. 4,624,200, Cl. 112-121.120.
Fitzpatrick, Gerald L., to Sigma Research, Inc. Flaw imaging in ferrous and nonferrous materials using magneto-optic visualization. 4,625,167, Cl. 324-235.000.
Fitzpatrick, Mark E.; Tsui, Cyrus Y.; Chan, Andrew K.; and Chan, Albert L., to Monolithic Memories, Inc. Programmable array logic circuit with testing and verification circuitry. 4,625,311, Cl. 371-15.000.
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Flannery, Harold F.: *See—*
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Fleissner, Gerold, to Fleissner GmbH & Company. Process and apparatus for washing textile material. 4,624,023, Cl. 8-151.000.
Fleissner GmbH & Company: *See—*
Fleissner, Gerold, 4,624,023, Cl. 8-151.000.
Fletcher, Aaron N.: *See—*
McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E., 4,624,753, Cl. 204-58.500.
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Zink, Rudolf; and Fletcher, Ian J., 4,625,027, Cl. 284-129.000.
Fletcher, Taylor C., to American Hospital Supply Corporation. Liquid bath temperature control. 4,625,096, Cl. 219-331.000.
Fleuret, Daniel: *See—*
Anne, Jean; Roy, Claude; and Fleuret, Daniel, 4,624,037, Cl. 29-25.420.
Flonic: *See—*
Rebjock, Alain; and Rose, Rene , 4,625,102, Cl. 235-492.000.
Flotronics AG: *See—*
Marchant, Derek N., 4,624,628, Cl. 417-393.000.
Flowdril Corporation: *See—*
Reichman, James R., 4,624,327, Cl. 175-67.000.
Flowerday, Carl W., to Prince Corporation. Visor with pivoted concealed vanity mirror. 4,624,499, Cl. 296-97.00H.
Flowers, Thaddeus S.: *See—*
Radek, John R.; and Flowers, Thaddeus S., 4,624,455, Cl. 271-85.000.
Floyd, David M.; Fritz, Alan W.; and Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. Process for preparing (s)-3-amino-2-oxo-1-azetidinesulfonic acid salts. 4,625,022, Cl. 540-355.000.
Floyd, William C.; and North, Bernard F., to Sun Chemical Corporation. Novel cyclic ureas. 4,625,029, Cl. 544-309.000.
Foletta, John D. Automatic flushing system. 4,624,017, Cl. 4-304.000.
Ford, Edward I., to Medical Designs, Inc. Leg brace for controlling subluxation. 4,624,247, Cl. 128-80.00C.
Ford Motor Company: *See—*
Mourray, Jack W., 4,624,347, Cl. 188-322.150.
Forest, Charles W. Pocket sharpener for knives. 4,624,157, Cl. 76-86.000.
Forman, Everett W. In-the-wall clock. 4,624,579, Cl. 368-88.000.
Forster, Eckehard F. O.: *See—*
Rudolph, Gunter W.; Stercken, Karl; and Forster, Eckehard F. O., 4,624,298, Cl. 164-486.000.
Foss, David J.: *See—*
Abbey, Kirk J.; Foss, David J.; and Kunz, Barbara L., 4,624,762, Cl. 204-181.700.
Fostco, Inc.: *See—*
Foster, Don M., 4,624,055, Cl. 33-126.500.
Foster, Don M., to Fostco, Inc. Consecutive reading gauging bob. 4,624,055, Cl. 33-126.500.
Foster, Randy C., to Dayco Corporation. Belt tensioner, part therefor and methods of making the same. 4,624,652, Cl. 474-135.000.
Four Seasons Solar Product Corp.: *See—*
Esposito, Christopher, 4,624,084, Cl. 52-173.00R.
Fowler, Daniel L.; and Froeb, John W., to Robertshaw Controls Company. Rotary switch construction and method of making the same. 4,625,084, Cl. 200-11.0DA.
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Martin, Jean; and LaFosse, Claude, 4,624,825, Cl. 376-227.000.
Framatome & Cie.: *See—*
Malagola, Philippe A.; and Vassal, Jean-Marie J., 4,624,750, Cl. 204-26.000.
Frank, Earl E., to Abex Corporation. Spring rail frog. 4,624,428, Cl. 246-276.000.
Frank Storimans Limited: *See—*
Storimans, Franciscus J. A., 4,624,289, Cl. 140-105.000.
Franke, Rudiger; Weiss, Aby; Goergen, Hans; Niemann-Delius, Christian; and Kay, Frank, to Mannesmann Aktiengesellschaft. Method of excavating overburden in surface mining operations. 4,624,504, Cl. 299-18.000.
Franseen, Richard E.: *See—*
Bender, Edward J.; Patrick, E. Vincent; and Franseen, Richard E., 4,625,106, Cl. 250-213.0VT.
Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: *See—*
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,624,855, Cl. 426-501.000.
Franzino, Peter R., to Zip Clip, Inc. Hair curling device. 4,624,272, Cl. 132-40.000.
Frayer, Paul D., to Rogers Corporation. High temperature polyimide processing aid. 4,624,978, Cl. 524-104.000.
Freadman, Tommyca, to Konutra Industries, Ltd. Integrated amplifier and speaker system with improved cooling efficiency. 4,625,328, Cl. 381-111.000.
Freedom, John. Fertility calculator. 4,625,099, Cl. 235-88.0RC.
Freese, Milan W. Pallet dispenser. 4,624,616, Cl. 414-129.000.
Freudenberg, Tillmann. Electro-magnetic vibration-damping mount. 4,624,435, Cl. 248-550.000.
Freund, David M.: *See—*
Strongosky, John M.; and Freund, David M., 4,624,375, Cl. 211-170.000.
Fricker, Siegfried: *See—*
Dunker, Friedrich W., 4,624,089, Cl. 52-410.000.
Friedrich, Uwe W. Collapsible container or carrying case. 4,624,381, Cl. 220-7.000.
Frisch, Herbert, to Enfo Grundlagenforschungs AG. Electropneumatic signal converter. 4,625,139, Cl. 310-330.000.
Fritschel, Scott J.; and Saunders, William D., to Du Pont de Nemours, E. I., and Company. Curing of thermoplastic tetrafluoroethylene/perfluoroalkyl ethylene copolymers. 4,624,988, Cl. 525-151.000.
Fritz, Alan W.: *See—*
Floyd, David M.; Fritz, Alan W.; and Cimarusti, Christopher M., 4,625,022, Cl. 540-355.000.
Froeb, John W.: *See—*
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Frohn, Walter. Degasifying valve for containers. 4,624,286, Cl. 137-859.000.
Frye, Richard D.; Huff, John P.; and Barnette, Rhodes H. Foldable auxilliary steering arm for trolling motors. 4,624,206, Cl. 114-146.000.
Fuji Kagakushi Kogyo Co., Ltd.: *See—*
Shini, Masami, 4,624,881, Cl. 428-207.000.
Fuji Photo Film Co., Ltd.: *See—*
Idota, Yoshio; and Yagihara, Morio, 4,624,911, Cl. 430-251.000.
Miyasaka, Nobuaki; Nakamura, Koki; and Yokoyama, Shigeki, 4,624,913, Cl. 430-444.000.
Ohtsuka, Shuichi; Matsuoka, Hiroshi; and Sato, Yoshimitsu, 4,624,554, Cl. 355-64.000.
Takeda, Keiji, 4,624,910, Cl. 430-203.000.
Fuji Standard Research Kabushiki Kaisha: *See—*
Miyauchi, Terukatsu; Ikeda, Yoneichi; Nakagawa, Takao; Tsutsui, Toshio; and Kikuchi, Tatsuji, 4,624,807, Cl. 264-12.000.
Fujigaya, Kazuyuki; Ogawa, Naoki; Shimonosono, Hitoshi; and Minezaki, Yutaka, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,624,221, Cl. 123-41.080.
Fujii, Hideji: *See—*
Hayakawa, Takayuki; Nakagawa, Manabu; Fujii, Hideji; and Sato, Shigeru, 4,625,117, Cl. 250-385.000.
Fujii, Mitsugu: *See—*
Fukushima, Tsunekazu; Fujii, Mitsugu; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,624,927, Cl. 436-16.000.
Fujikawa, Yoshihiro: *See—*
Sasaki, Tadashi; Fujikawa, Yoshihiro; Sakoda, Ryozo; Sakashita, Mitsuaki; and Hibi, Morihide, 4,624,950, Cl. 514-222.000.
Fujimori, Hiroyoshi; Nagasaki, Tatsuo; Kato, Tadashi; and Sasaki, Masahiko, to Olympus Optical Co., Ltd. Light source means for endoscope employing solid state imaging device. 4,625,236, Cl. 358-98.000.
Fujimoto, Hiroshi, to Toyo Seikan Kaisha Limited. Easy-to-open lid of a container. 4,624,387, Cl. 220-273.000.
Fujinawa, Shoji; Hashiba, Isao; Suzuki, Kenji; Tsuchiya, Syuzi; and Takakuwa, Yasuo, to Nissan Chemical Industries Ltd. Process for preparing optically active 2-(4-hydroxy-phenoxy) propionic acid compounds. 4,625,053, Cl. 562-401.000.
Fujitsu Limited: *See—*
Hamaguchi, Shin-ichi, 4,625,121, Cl. 250-492.200.
Isogai, Hideaki; and Fukushi, Isao, 4,625,299, Cl. 365-189.000.
Itaya, Eiji; Takano, Takeshi; and Nakamura, Takaharu, 4,625,180, Cl. 331-2.000.
Mizuno, Tsuneo; Takada, Noboru; Shimura, Michio; Satoh, Tohru; and Matsuda, Tadashi, 4,625,221, Cl. 346-140.00R.
Tani, Satoru, 4,624,047, Cl. 29-576.00W.

Ueno, Kouji, 4,625,129, Cl. 307-446.000.
Yanase, Takeyasu, 4,625,297, Cl. 365-39.000.
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Fukatsu, Takeo: *See*—
Haku, Hisao; Goto, Kazuyuki; Tanaka, Masayuki; Fukatsu, Takeo; and Kuwano, Yukinori, 4,624,905, Cl. 430-65.000.
Fukaya, Yasuhiro: *See*—
Ohmae, Takashi; Fukaya, Yasuhiro; and Hirai, Shozo, 4,624,404, Cl. 228-198.000.
Fukuda, Makoto: *See*—
Yuzawa, Keiji; Matsumoto, Naoaki; Kayahara, Takehiko; Tateishi, Naofumi; and Fukuda, Makoto, 4,624,171, Cl. 84-1.030.
Fukumoto, Takaaki, to Mitsubishi Denki Kabushiki Kaisha. Device for measuring the abeolute value of the density of salts in atmosphere. 4,624,834, Cl. 422-90.000.
Fukushi, Isao: *See*—
Isogai, Hideaki; and Fukushi, Isao, 4,625,299, Cl. 365-189.000.
Fukushi, Yukihiro; and Segawa, Hiroyuki, to Kabushiki Kaisha Toshiba. Image forming apparatus with a sorter. 4,624,546, Cl. 355-14.00R.
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Nagano, Eiki; Takemoto, Ichiki; Fukushima, Masayuki; Yoshida, Ryo; and Matsumoto, Hiroshi, 4,624,699, Cl. 71-92.000.
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Fuller Company: *See*—
Willis, Daniel A., 4,624,636, Cl. 432-78.000.
Funabashi, Tadashi: *See*—
Kanamaru, Hitoshi; Funabashi, Tadashi; Takahashi, Junji; and Kato, Kyoichi, 4,625,304, Cl. 369-75.200.
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Fukushima, Tsunekazu; Fujii, Mitsugu; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,624,927, Cl. 436-16.000.
Funk, James E., to Alfred University Research Foundation, Inc. Coal-water slurry and method for its preparation. 4,624,680, Cl. 44-51.000.
Furgerson, David J., to Hydril Company. Tubular connection. 4,624,488, Cl. 285-334.000.
Furuhashi, Hiroyuki: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,625,003, Cl. 526-119.000.
Futaba, Takeshi, to Koyo Auto-Mech. Co. Ltd. Rotary control valve of power steering system and method of producing spool valve member. 4,624,283, Cl. 137-625.240.
G&H Technology, Inc.: *See*—
VanBrunt, Michael K., 4,625,072, Cl. 174-35.00R.
GA Technologies Inc.: *See*—
Creedon, Richard L.; and Howanick, John J., 4,624,173, Cl. 89-8.000.
Purcell, John R., 4,625,193, Cl. 335-216.000.
Gabriel, Edmond; and Killian, Edmund, to Finkel Outdoor Products, Inc. Table locking plugs. 4,624,598, Cl. 403-24.000.
Gagnon, Peter R., to GTE Products Corporation. Tungsten halogen lamp with light source capsule containment device. 4,625,140, Cl. 313-25.000.
Gallagher, Lawrence J., to Loral Electro-Optical Systems. Laser simulator for a firing port weapon. 4,624,641, Cl. 434-21.000.
Galle, James E.: *See*—
Mares, Frank; Tang, Reginald Y.; Galle, James E.; and Federici, Rose M., 4,625,023, Cl. 540-539.000.
Galloway, Gary: *See*—
Chetty, P. R. K.; Galloway, Gary; and Thollot, Pierre, 4,625,271, Cl. 363-49.000.
Gangi, Alfred J., to Newest, Inc. Process for converting solid waste and sewage sludge into energy sources and separate recyclable by-products. 4,624,417, Cl. 241-17.000.
Ganysh, Yaroslav V.: *See*—
Maximovich, Georgy G.; Ganysh, Yaroslav V.; Shatinsky, Viktor F.; Ljuty, Evgeny M.; and Tretyak, Ivan J., 4,624,871, Cl. 427-431.000.
Garcia, Carlos M.; and McLeod, Dale K. Pipe cutter with enclosed feed means. 4,624,052, Cl. 30-97.000.
Gardner, Gerald C.: *See*—
Grigorenko, Donald C.; and Gardner, Gerald C., 4,624,386, Cl. 220-269.000.
Garrett Corporation, The: *See*—
Kasabian, George, 4,625,135, Cl. 310-156.000.
Saville, Marshall P.; and Gu, Alston L., 4,624,583, Cl. 384-105.000.
Garst, Roger H.: *See*—
Phifer, John E.; Tucker, Charles R.; and Garst, Roger H., 4,624,793, Cl. 252-8.600.
Gartner, Karl: *See*—
Kriwetz, Gert; and Gartner, Karl, 4,625,118, Cl. 250-432.0PD.
Gassner, Theo; and Fehr, Rolf, to Hilti Aktiengesellschaft. Device for driving fastening elements. 4,624,401, Cl. 227-125.000.
Gathright, Grady C.: *See*—
Gathright, John B.; and Gathright, Grady C., 4,624,041, Cl. 29-263.000.
Gathright, John B.; and Gathright, Grady C., to Gathright Puller, Inc. Sleeve bearing puller. 4,624,041, Cl. 29-263.000.
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Gathright, John B.; and Gathright, Grady C., 4,624,041, Cl. 29-263.000.
Gauckler, Jacques: *See*—
Clermont, Christian; de Moncuit, Marc; and Gauckler, Jacques, 4,624,778, Cl. 210-321.300.
Gaudet, James L.: *See*—
Barnes, Johnny G.; Gaudet, James L.; Hurley, Patrick J.; and Neuman, Grover H., 4,624,591, Cl. 400-171.000.
Gauthier, Andre , to SAT. Process for passivation of photoconductive detectors made of Hg Cd Te. 4,624,715, Cl. 148-6.14R.
Gay Engineering & Sales Co., Inc.: *See*—
Hilborn, Howard L.; and Strebel, Michael, 4,625,200, Cl. 340-596.000.
GE. SV. IN. S.R.l.: *See*—
Grassi, Gino, 4,624,265, Cl. 128-784.000.
Gebauer, Helmut, to Consortium fur elektrochemische Industrie GmbH. Alpha-tertiary nitriles. 4,625,046, Cl. 558-388.000.
Gee, James M.; and Hargis, Philip J., Jr., to United States of America, Energy. Laser/plasma chemical processing of substrates. 4,624,736, Cl. 156-643.000.
Geelen, Mathias H.: *See*—
Kitzen, Wilhelmus J. W.; and Geelen, Mathias H., 4,625,326, Cl. 381-17.000.
Geffcken, Walter, to Siemens AG. Gas discharge display device with an auxiliary anode control plate. 4,625,148, Cl. 313-485.000.
Geiger, Rolf: *See*—
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,624,962, Cl. 514-412.000.
Geiser, Markus; and Vandevoir, Claude, to Sameca, S.A. Guide-bar device for multi-spindle lathe. 4,624,612, Cl. 414-18.000.
Geist, Michael; Ott, Gunther; and Schon, Georg, to BASF Farben und Fasern Aktiengesellschaft. Water-dispersible binders for cationic electro-dip paints, and method for their production. 4,624,974, Cl. 523-414.000.
Genentech, Inc.: *See*—
Hershberg, Robert D., 4,624,918, Cl. 435-68.000.
General Electric Company: *See*—
Aftergut, Sigfried; and Cole, Herbert S., 4,624,532, Cl. 350-349.000.
Anthony, Blair T., 4,624,870, Cl. 427-387.000.
Arnold, Jerold W., 4,624,162, Cl. 83-74.000.
Axelrod, Robert J.; and Cooper, Glenn D., 4,624,979, Cl. 524-140.000.
Brogan, Robert W., 4,624,586, Cl. 384-307.000.
Cearley, James E.; Carruth, John C.; Dixon, Robert C.; Spencer, Stephanie S.; and Zuloaga, Jaime A., Jr., 4,624,826, Cl. 376-327.000.
Davis, Gary C., 4,624,724, Cl. 156-264.000.
Evans, Thomas L.; and Grade, Marsha M., 4,625,013, Cl. 528-172.000.
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Germer, Warren R., 4,625,163, Cl. 324-103.00R.
General Electric Company, p.l.c., The: *See*—
Newman, Peter, 4,625,306, Cl. 370-60.000.
General Hospital Corporation, The: *See*—
Wedeen, Van J.; and Rosen, Bruce R., 4,625,169, Cl. 324-309.000.
General Instrument Corporation: *See*—
Mannerstrom, Leif R., 4,625,178, Cl. 330-149.000.
General Kinematics Corporation: *See*—
Danner, Gary A.; and Sherman, Raymond W., 4,624,370, Cl. 209-631.000.
General Motors Corporation: *See*—
Bertollini, Gary P., 4,624,570, Cl. 356-373.000.
Matekunas, Frederic A., 4,624,229, Cl. 123-425.000.
Genesio, Rene; Martinez, Jean P.; and Schmitt, Romain, to Pont-A-Mousson S.A. Rolling pipe centering apparatus. 4,624,637, Cl. 432-239.000.
Gengler, John: *See*—
Namowicz, Julian; and Gengler, John, 4,624,161, Cl. 83-47.000.
Gentry, Samuel H. Mechanical puller. 4,624,449, Cl. 254-231.000.
Gentzel, Frederick F.: *See*—
DeRossett, Edmund Z.; and Gentzel, Frederick F., 4,624,666, Cl. 604-366.000.
Georg Fischer Aktiengesellschaft: *See*—
Fehr, Kurt; Henych, Ivo; and Pavlovsky, Rudolf, 4,624,702, Cl. 75-93.00R.
Thalmann, Alfred, 4,624,487, Cl. 285-197.000.
Georgiev, Vassil S.; and Mack, Robert A., to Pennwalt Corporation. N-(phenyl) or N-(phenylcyclopropyl)-2,5-dihydro-2-oxo-4[(substituted phenyl)amino]-3-furancarboxamide derivatives. 4,625,040, Cl. 549-321.000.
Gerard, Jean-Louis; and Le Marchand, Claude, to Societe Anonyme D.B.A. Spring for the pads of a disc brake with sliding caliper, and disc brake equipped with such a spring. 4,624,344, Cl. 188-73.360.
Gerard, Joyez: *See*—
Yves, Drutel; and Gerard, Joyez, 4,624,179, Cl. 100-4.000.
Gerard, Philippe: *See*—
Capra, Thierry; and Gerard, Philippe, 4,624,858, Cl. 427-38.000.
Germer, Warren R., to General Electric Company. Display temperature compensator for electric meter. 4,625,163, Cl. 324-103.00R.
Gerritsen, Jan; Barten, Piet G. J.; and Mensies, Otto, to U.S. Philips Corporation. Color display tube with magnetic field shaping means. 4,625,145, Cl. 313-413.000.
Gersbach, Klaus: *See*—
Bocker, Jurgen; Gersbach, Klaus; and Klein, Klaus W., 4,624,187, Cl. 102-520.000.
Gess, Jerome M., to Weyerhaeuser Company. Cationic cellulose product and method for its preparation. 4,624,743, Cl. 162-164.100.

Geszteiyi, Adamne N.: *See*—
Hevesi, Jeno ; Gyapai, Janos; Szudy, Gabor; Nagy, Balint; Vago, Arpad; Gesztelyi, Adamne N.; and Keszler, Jozsef, 4,624,419, Cl. 241-101.00B.

Gewerkschaft Eisenhytte Westfalia: *See*—
Temme, Helmut; Schoop, Gunther-Dietmar; and Schewinski, Hartmut, 4,624,362, Cl. 198-735.000.

Gibson, Harold R., to Schlegel Corporation. Single-wire carrier edge protector trim strip. 4,624,093, Cl. 52-716.000.

Gics, Paul W. Center wall with sloped ends for a microwave heat applicator. 4,625,088, Cl. 219-10.55A.

Gics, Paul W. Water load container device for a microwave heat applicator. 4,625,089, Cl. 219-10.55R.

Gietman, Peter J., Jr., to Custom Machinery Design, Inc. Folding and packaging system. 4,624,095, Cl. 53-117.000.

Gile, Richard H.; and Bourgoine, Edward C., to Ex-Cell-O Corporation. Orthogonal dressing of grinding wheels. 4,624,236, Cl. 125-11.00R.

Gillett, Daniel D.; and Stacherski, Raymond, to Onan Corporation. Load sensitive fuel cutoff and method to increase engine stability. 4,625,123, Cl. 290-40.00B.

Gillette Company, The: *See*—
Apprille, Domenic V., Jr.; Chesnauskas, Ralph J.; Jacobson, Chester F.; and Trotta, Robert A., 4,624,051, Cl. 30-50.000.

Gilman, Paul S.: *See*—
Jatkar, Arun D.; Gilman, Paul S.; and Benn, Raymond C., 4,624,705, Cl. 75-239.000.

Gindrup, Wayne L.; and Vinson, Rebecca R., to Carolina Solvents, Inc. Electrically conductive magnetic microballoons and compositions incorporating same. 4,624,798, Cl. 252-62.540.

Gindrup, Wayne L.; and Vinson, Rebecca R., to Carolina Solvents, Inc. Electrically conductive microballoons and compositions incorporating same. 4,624,865, Cl. 427-126.200.

Giniewicz, Jayne R.; Safari, Ahmad; Newnham, Robert E.; and Cross, Leslie E., to Celanese Corporation. Piezoelectric filler and flexible piezoelectric composites. 4,624,796, Cl. 252-62.900.

Girardi, Marilyn A.: *See*—
Girardi, Michael J.; and Girardi, Marilyn A., 4,624,398, Cl. 225-21.000.

Girardi, Michael J.; and Girardi, Marilyn A. Tape dispensing and cutting receptacle. 4,624,398, Cl. 225-21.000.

Glass, Geoffrey M. Barricade. 4,624,210, Cl. 116-63.00P.

Glass, Howard L., to Rockwell International Corporation. Intermediary layers for epitaxial hexagonal ferrite films. 4,624,901, Cl. 428-469.000.

Glazer, Edward A., to Pfizer Inc. Antiprotozoal 1,4-di(p-amidinophenyl)imidazoles. 4,624,958, Cl. 514-341.000.

Gleason, Anthony M.: *See*—
Mintz, Donald J.; and Gleason, Anthony M., 4,624,764, Cl. 204-188.000.

Glennon, Kenneth W. Procedure and rules for playing Indy Class 500. 4,624,463, Cl. 273-246.000.

Gneiding, Donald R.: *See*—
Palmer, Stephen W.; and Gneiding, Donald R., 4,624,390, Cl. 222-3.000.

Goad, Bobby F., to Baker Oil Tools, Inc. Locking mechanism for hydraulic running tool for well hangers and the like. 4,624,311, Cl. 166-125.000.

Goergen, Hans: *See*—
Franke, Rudiger; Weiss, Aby; Goergen, Hans; Niemann-Delius, Christian; and Kay, Frank, 4,624,504, Cl. 299-18.000.

Gokan, Hiroshi: *See*—
Saotome, Yasushi; Gokan, Hiroshi; Saigo, Kazuhide; Suzuki, Masayoshi; and Ohnishi, Yoshitake, 4,624,909, Cl. 430-192.000.

Goldberg, Edward M.; and Bazell, Seymour. Syringe with pressure sensing means. 4,624,659, Cl. 604-121.000.

Goldenberg, Milton D., to Immunomedics, Inc. Method for enhancing target specificity of antibody localization and clearance of non-target diagnostic and therapeutic principles. 4,624,846, Cl. 424-1.100.

Golder, Willis E.; Ierardi, Joseph A.; Staples, Robert E.; and Boyle, Michael C., to Pylon Company. Vacuum actuated bi-level test fixture. 4,625,164, Cl. 324-158.00F.

Goldstein, Gideon: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,624,925, Cl. 435-240.000.

Goldstein, Yehiel. System used in raising livestock. 4,624,215, Cl. 119-51.00R.

Golfing Way Limited: *See*—
Way, Denys R., 4,624,461, Cl. 273-184.00B.

Gonsalves, Alfred: *See*—
Lawrence, Manuel; and Gonsalves, Alfred, 4,624,039, Cl. 29-257.000.

Goodfellow, Robert C.; and Carter, Andrew C., to Plessey Overseas Limited. Integrated light detection or generation means and amplifying means. 4,625,225, Cl. 357-30.000.

Goodman, Charles W., Jr. Adjustable outboard transom. 4,624,438, Cl. 248-642.000.

Goodman, David S.: *See*—
Anhalt, John W.; and Goodman, David S., 4,624,517, Cl. 339-75.00M.

Goodyear Tire & Rubber Company, The: *See*—
Hinks, William L.; and Kinstler, John R., 4,625,101, Cl. 235-462.000.

Gordon, Samuel Y.: *See*—
Weiner, Herbert S.; Mills, William L.; Perkins, Charles E.; Lau, Chi-Leung; Mayhew, Jeffrey P.; and Gordon, Samuel Y., 4,625,288, Cl. 364-521.000.

Goschke, Richard, to Ciba-Geigy Corporation. Substituted pyridazinones, pharmaceutical preparations containing these compounds, and the use thereof. 4,624,951, Cl. 514-234.000.

Goto, Kazuyuki: *See*—
Haku, Hisao; Goto, Kazuyuki; Tanaka, Masayuki; Fukatsu, Takeo; and Kuwano, Yukinori, 4,624,905, Cl. 430-65.000.

Gould, Arnold S.; and Ciannella, Michael A., to Medi-Tech, Incorporated. Medical devices having inflatable portions. 4,624,657, Cl. 604-103.000.

Gould Inc.: *See*—
Robbins, Richard W., 4,625,195, Cl. 337-159.000.

Gould, Michael H., to National Research Development Corporation. Filtering apparatus. 4,624,782, Cl. 210-268.000.

Gould, Ronald R., to Advance Lifts, Inc. Ground supported leveler for vehicle dockage. 4,624,446, Cl. 254-88.000.

Goulding, Leslie B.; and Johnson, Ian F., to James Walker & Co., Shaped article of composition comprising thermoplastic synthetic resin and cellular material and method of producing same. 4,624,880, Cl. 428-143.000.

Grace, Garland K. Ice cream tub cutter. 4,624,163, Cl. 83-411.00R.

Grade, Marsha M.: *See*—
Evans, Thomas L.; and Grade, Marsha M., 4,625,013, Cl. 528-172.000.

Graham, James R.; and Huntington, John G., to Occidental Research Corporation. Process for producing benzene carboxylic acids from aromatic material utilizing an aliphatic organic acid agent. 4,625,056, Cl. 562-407.000.

Granger, Donald W.: *See*—
Faul, Donald; Broussard, Paul P.; and Granger, Donald W., 4,624,130, Cl. 73-40.700.

Grassi, Gino, to GE. SV. IN. S.R.l. Electro-catheter used in physiological cardiac stimulation simulative of the auriculo-ventricular sequence, featuring active engagement of the cardiac muscle. 4,624,265, Cl. 128-784.000.

Gray, Robert R.; and Lindahl, Thomas G. Construction for pulse jet combustor dehydration section. 4,624,635, Cl. 432-58.000.

Green Cross Corporation, The: *See*—
Fukushima, Tsunekazu; Fujii, Mitsugu; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,624,927, Cl. 436-16.000.

Green, David L. Rental contract timer system. 4,624,578, Cl. 368-10.000.

Green, Nicola; and Alexander, Stephen, to Scripps Clinic & Research Foundation. Broad spectrum influenza antisera. 4,625,015, Cl. 530-324.000.

Green, Philip S., to SRI International. Ultrasonic reflex transmission imaging method and apparatus with external reflector. 4,624,143, Cl. 73-620.000.

Green, Richard A., to Westinghouse Electric Corp. Robotic clamp and index tool and method for their use in repairing certain elements with in a nuclear reactor. 4,624,042, Cl. 29-402.080.

Greening Donald Co. Ltd.: *See*—
Wilcox, Robert J., 4,624,097, Cl. 57-232.000.

Greenwood, Gary G.: *See*—
Lawman, Dennis J.; and Greenwood, Gary G., 4,624,448, Cl. 254-122.000.

Greenwood, William S.; Weinmann, Karl; and Weindel, Reinhold, to Thomas & Betts Corporation. Receptacle for flat multiconductor cable. 4,624,522, Cl. 339-99.00R.

Greig, Colin C.: *See*—
Baker, Richard R.; Dashley, Frederick J.; McCormack, Anthony D.; and Greig, Colin C., 4,624,268, Cl. 131-332.000.

Grendahl, Dennis T., to Surgidev Corporation. Corneal inlay with holes. 4,624,669, Cl. 623-5.000.

Grieshaber, Hermann; and Kull, Hermann, to Robert Bosch GmbH. Method and apparatus for determining the full-load limit of an internal combustion engine. 4,624,230, Cl. 123-445.000.

Griffel, Jack: *See*—
Long, Robert B.; and Griffel, Jack, 4,624,776, Cl. 208-302.000.

Griffiths, Brian J.: *See*—
Cooke, David J.; Griffiths, Brian J.; John, Vivian B.; and Sawicki, George C., 4,624,794, Cl. 252-8.800.
White, James W.; Westall, Stephen; and Griffiths, Brian J., 4,624,676, Cl. 8-115.560.

Grigorenko, Donald C.; and Gardner, Gerald C. Easy opening can top. 4,624,386, Cl. 220-269.000.

Gross, Jack R., to NCR Corporation. Flexible drive system. 4,624,359, Cl. 198-366.000.

Grotz, Bernard J., Jr., to C. F. Braun & Co. Temperature controlled ammonia synthesis process. 4,624,842, Cl. 423-360.000.

Grunbeck Wasseraufbereitung GmbH: *See*—
Arens, Hans; Kern, Hans; and Haslberger, Richard, 4,624,279, Cl. 137-218.000.

Grunewald, Hans-Joachim, to Autoliv Development AB. Seat belt fitting. 4,624,479, Cl. 280-808.000.

Grutzmacher, Bertold; and Krestyn, Karl-Heinz, to Heidelberger Druckmaschinen AG. Sheet feeder for printing machines. 4,624,454, Cl. 271-30.100.

GTE Communication Systems Corp.: *See*—
Boeckmann, Eduard F. B., 4,625,128, Cl. 307-310.000.

GTE Products Corporation: *See*—
Gagnon, Peter R., 4,625,140, Cl. 313-25.000.
Haraden, Thomas, 4,624,513, Cl. 339-1.00L.

Keeffe, William M.; Krasko, Zeya K.; and Karlotski, Robert J., 4,625,141, Cl. 313-25.000.
Port, David J.; Houck, David L.; and Kinney, Frank D., 4,624,700, Cl. 75-0.5BB.
Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, Michael J., 4,624,844, Cl. 423-593.000.
Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., 4,624,703, Cl. 75-101.00R.
Yale, Ramon L.; and Shearer, Nelson W., 4,624,861, Cl. 427-65.000.

Gu, Alston L.: *See—*
Saville, Marshall P.; and Gu, Alston L., 4,624,583, Cl. 384-105.000.

Guilbault, Lawrence J.; McEntee, Thomas C.; and Koob, Judith L., to Morton Thiokol, Inc. Method for controlling antimicrobial content of fibers. 4,624,677, Cl. 8-490.000.

Gunderson, Inc.: *See—*
Kaleta, Gary S., 4,624,188, Cl. 105-355.000.

Gusack, James A.; and Smith, Thomas E., to Badische Corporation. Dilatable, individually cast coating die. 4,624,817, Cl. 264-225.000.

Guscott, John K., to American District Telegraph Company. Ceiling mountable passive infrared intrusion detection system. 4,625,115, Cl. 250-353.000.

Gyapai, Janos: *See—*
Hevesi, Jeno ; Gyapai, Janos; Szudy, Gabor; Nagy, Balint; Vago, Arpad; Gesztelyi, Adamne N.; and Keszler, Jozsef, 4,624,419, Cl. 241-101.00B.

Haas, Armand, to Societe Chimique des Charbonnages-CdF Chimie. Cold-stretchable, self-adhesive film composition. 4,624,991, Cl. 525-209.000.

Haas, Franz, Jr.: *See—*
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,624,855, Cl. 426-501.000.

Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H. Process for making rolled wafer cones. 4,624,855, Cl. 426-501.000.

Haas, Johann: *See—*
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,624,855, Cl. 426-501.000.

Hafner, Josef: *See—*
Knabel, Walter; Hafner, Josef; and Scheer, Martin, 4,624,473, Cl. 280-612.000.

Haggerty, Peter D.: *See—*
Lea, James M.; and Haggerty, Peter D., 4,624,877, Cl. 428-71.000.

Haines, Kenneth M.; Oder, Thomas D.; and Wood, John E., III. Tractor earth-treating implement connector. 4,624,471, Cl. 280-411.00R.

Hait, Paul W., to Pyromid, Inc. Device interchangeable as an outdoor stove and a table. 4,624,238, Cl. 126-9.00R.

Haku, Hisao; Goto, Kazuyuki; Tanaka, Masayuki; Fukatsu, Takeo; and Kuwano, Yukinori, to Sanyo Electric Co., Ltd. Electrophotographic photosensitive member. 4,624,905, Cl. 430-65.000.

Halcon SD Group, Inc., The: *See—*
Rizkalla, Nabil, 4,625,055, Cl. 562-406.000.
Rizkalla, Nabil, 4,625,060, Cl. 562-607.000.

Hall, William E. Stop device for outboard engine propellers. 4,624,644, Cl. 440-49.000.

Haller, Fritz: *See—*
Walk, Johann; Studtmann, Rainer; and Haller, Fritz, 4,624,360, Cl. 198-398.000.

Hallford, Ben R., to Rockwell International Corporation. Space feedback apparatus for field effect transistors. 4,625,179, Cl. 330-286.000.

Halliburton Company: *See—*
Baldridge, Morris G.; and Sullaway, Bob L., 4,624,316, Cl. 166-325.000.
Barrington, Burchus Q., 4,624,317, Cl. 166-334.000.
McMullin, Kurt M., 4,624,312, Cl. 166-155.000.
Smith, Harry D., Jr., 4,625,110, Cl. 250-269.000.
Smith, Harry D., Jr., 4,625,111, Cl. 250-270.000.
Stromberg, James L., 4,624,483, Cl. 285-24.000.
White, Billy W., 4,624,308, Cl. 166-65.100.

Hallot, Andre : *See—*
Biziere, Kathleen; Chambon, Jean-Pierre; and Hallot, Andre , 4,624,952, Cl. 514-252.000.

Haluska, Loren A.; and Molzahn, Marcelle A., to Dow Corning Corporation. Silane compounds. 4,625,031, Cl. 546-14.000.

Hamabe, Yoshifumi: *See—*
Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, 4,624,587, Cl. 400-83.000.

Hamaguchi, Shin-ichi, to Fujitsu Limited. Method of electron beam exposure. 4,625,121, Cl. 250-492.200.

Hamburger Stahlwerke GmbH: *See—*
Rudolph, Gunter W.; Stercken, Karl; and Forster, Eckehard F. O., 4,624,298, Cl. 164-486.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler and method of making and using same. 4,624,733, Cl. 156-541.000.

Hammarskog, Bjorn; Mathisson, Goran; and Santen, Sven, to SKF Steel Engineering AB. Method and plant for cooling pellets. 4,624,059, Cl. 34-20.000.

Hammonds, R. Glenn, Jr.: *See—*
Li, Choh H.; Chung, David; Hammonds, R. Glenn, Jr.; and Ramasharma, Kristipati, 4,624,944, Cl. 514-12.000.

Haneda, Satoshi; Itaya, Masahiko; and Tomono, Makoto, to Konishiroku Photo Industry Co., Ltd. Developing method for electrostatic latent image. 4,624,559, Cl. 355-14.00D.

Hanin, Jean A. A., to Exxon Research & Engineering Co. Hydroformylation catalyst removal. 4,625,067, Cl. 568-451.000.

Hanisch, Horst: *See—*
Bernhardt, Gunther; and Hanisch, Horst, 4,625,006, Cl. 526-279.000.

Hanks, James V.; and Raines, Charles D., to Horton Manufacturing Co., Inc. Fluid pressure operated, axially-engaging clutch. 4,624,356, Cl. 192-85.0CA.

Hansen, David G.: *See—*
Poole, Forrest R.; and Hansen, David G., 4,624,248, Cl. 128-89.00R.

Hanser, Walter: *See—*
Widera, Axel; Schiessl, Alois; Hanser, Walter; Rayer, Peter; and Hieke, Klaus, 4,624,186, Cl. 102-336.000.

Hanssen, Adalbert; and Schwarz, Jurgen, to Carl-Zeiss-Stiftung. Arrangement for multiplying the output of an actuating manipulator by a factor dependent upon the speed of the actuating movement thereof to control the movement of a displaceable member of an apparatus. 4,624,537, Cl. 350-531.000.

Hanz, George J.; Jung, Guenter; and Pflaum, Michael, to Siemens Gammasonics, Inc. Structure for supporting a detector head. 4,625,116, Cl. 250-363.00S.

Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, to Hitachi, Ltd; and Hitachi Microcomputer Engineering, Ltd. Resin molded type semiconductor device having a conductor film. 4,625,227, Cl. 357-68.000.

Harada, Hiraku: *See—*
Wakayama, Katsuhiko; and Harada, Hiraku, 4,624,797, Cl. 252-62.520.

Harada, Hitoshi; and Ohsera, Yasumi, to Nippondenso Co., Ltd. Heat radiating insulation for coil. 4,624,884, Cl. 428-218.000.

Harada, Katsumasa: *See—*
Iwata, Fumio; Harada, Katsumasa; and Sugise, Ryoji, 4,625,025, Cl. 544-53.000.

Harada, Yoshinori: *See—*
Simada, Tamotu; Harada, Yoshinori; Kambara, Hideki; Nagai, Keiichi; and Tokita, Jirou, 4,624,769, Cl. 204-301.000.

Haraden, Thomas, to GTE Products Corporation. Lamp holder assembly having rotatable base shell. 4,624,513, Cl. 339-1.00L.

Harara, Mitsuhiko: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,624,476, Cl. 280-707.000.

Harborchem, Inc.: *See—*
Moore, John R.; and Maybaum, Stephen, 4,624,898, Cl. 428-446.000.

Harden, Albert J., Jr.: *See—*
Hinton, H. L.; and Harden, Albert J., Jr., 4,624,270, Cl. 132-39.000.

Harder, John R., to Mahaffy & Harder Engineering Co. Packaging apparatus for making gas-filled packages from plastic film. 4,624,099, Cl. 53-432.000.

Harding, Ronald H.; and Totten, George E., to Union Carbide Corporation. Method of indirect liquid-phase heat transfer. 4,624,299, Cl. 165-1.000.

Hardy, James E.: *See—*
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,624,840, Cl. 423-235.000.

Hargis, Philip J., Jr.: *See—*
Gee, James M.; and Hargis, Philip J., Jr., 4,624,736, Cl. 156-643.000.

Harper, Jack E., Jr., to LTV Aerospace and Defense Company. Apparatus for forming elongate structures of composite materials. 4,624,726, Cl. 156-323.000.

Harris Corporation: *See—*
Black, Jimmy C.; Roberts, Bruce E.; and Matlock, Dyer A., 4,624,749, Cl. 204-15.000.
Oehme, William J., 4,624,511, Cl. 312-273.000.

Harris, James E.: *See—*
Robeson, Lloyd M.; and Harris, James E., 4,624,997, Cl. 525-471.000.

Harsanyi, Kalman: *See—*
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.

Harshaw/Filtrol Partnership: *See—*
Modly, Zoltan M., 4,624,710, Cl. 106-290.000.

Hartmann, Jool, to Commissariat a l'Energie Atomique. Process for the autopositioning of an interconnection line on an electric contact hole of an integrated circuit. 4,624,864, Cl. 427-89.000.

Hartog, Stefan M.; and Hollmark, Bernt H. F., to Svenska Traforskningsinstitutet. Method for producing layers of dry fibres on a forming surface. 4,624,819, Cl. 264-510.000.

Harvey, Alwood E. Photographic enlarger apparatus with critical focusing platform for photosensitive medium. 4,624,553, Cl. 355-55.000.

Harwood, Leopold A., to RCA Corporation. I-phase flesh tone correction system using R-Y, G-Y and B-Y color difference signal demodulators. 4,625,233, Cl. 358-28.000.

Hasegawa, Toshihiko: *See—*
Hosoi, Hideki; Hasegawa, Toshihiko; and Hayashi, Hitoshi, 4,624,987, Cl. 525-84.000.

Hashiba, Isao: *See—*
Fujinawa, Shoji; Hashiba, Isao; Suzuki, Kenji; Tsuchiya, Syuzi; and Takakuwa, Yasuo, 4,625,053, Cl. 562-401.000.

Hashimoto Forming Industry Co., Ltd.: *See—*
Kitsukawa, Motohiko; and Suzuki, Atsuo, 4,624,121, Cl. 72-65.000.

Haslberger, Richard: *See—*
Arens, Hans; Kern, Hans; and Haslberger, Richard, 4,624,279, Cl. 137-218.000.
Hata, Yasuaki: *See—*
Ohtagaki, Shigeki; Wada, Shunichi; Hata, Yasuaki; Takizawa, Shozo; and Maruyama, Mitsunori, 4,624,478, Cl. 280-707.000.
Hauni-Werke Korber & Co. KG: *See—*
Janutta, Reinhard, 4,624,081, Cl. 51-98.500.
Haunschild, Willard M., to Chevron Research Company. Catalyst system for use in a distillation column reactor. 4,624,748, Cl. 203-29.000.
Hauserman, Inc.: *See—*
Diffrient, Niels, 4,624,083, Cl. 52-65.000.
Hawkswell, Victor T., to USM Corporation. Head for handling electrical components. 4,624,050, Cl. 29-740.000.
Hayakawa, Takayuki; Nakagawa, Manabu; Fujii, Hideji; and Sato, Shigeru, to Hitachi, Ltd.; and Hitachi Medical Corporation. Multicell radiation detector. 4,625,117, Cl. 250-385.000.
Hayashi, Haruo: *See—*
Ichimura, Yoshiaki; Kawabe, Natsuki; Hayashi, Haruo; and Uekido, Kouzou, 4,624,525, Cl. 339-177.00R.
Hayashi, Hitoshi: *See—*
Hosoi, Hideki; Hasegawa, Toshihiko; and Hayashi, Hitoshi, 4,624,987, Cl. 525-84.000.
Hayden, John R.; and Huetson, Curtis L., to AT&T Technologies, Inc. Apparatus for preheating printed circuit boards. 4,624,302, Cl. 165-80.200.
Hayes, James K., to Combustion Engineering, Inc. Expandable support for insertion into tube bundle. 4,624,304, Cl. 165-162.000.
Haymore, Ralph B.; and Winter, Heinz W., to Envirotech Corporation. Lifting mechanism for sedimentation device. 4,624,787, Cl. 210-531.000.
Haymore, Ralph B.: *See—*
Black, Brent C.; Bradley, Bruce D.; and Haymore, Ralph B., 4,624,783, Cl. 210-271.000.
Haynes, Joel E. Acoustical dry product density sensor. 4,624,129, Cl. 73-32.00A.
Hays, Byron G., to Inmont Corporation. Azo pigment composition containing a laked Azo pigment and fortified latex. 4,625,018, Cl. 534-724.000.
Heather, James B., to Stauffer Chemical Company. Process for preparation of trimethylsulfoxonium salts. 4,625,065, Cl. 568-27.000.
Hegedus, Bela: *See—*
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.
Hegge, Theodorus C. J. M.; and ter Wiel, Jan, to Packard Instrument B.V. Mixture for use in the LSC (liquid scintillation counting) analysis technique. 4,624,799, Cl. 252-301.170.
Heidelberger Druckmaschinen AG: *See—*
Grutzmacher, Bertold; and Krestyn, Karl-Heinz, 4,624,454, Cl. 271-30.100.
Pyliotis, Dimitrios, 4,624,182, Cl. 101-147.000.
Heidsiek, Horst; Jackel, Gernot; and Becker, Horst, to Degussa Aktiengesellschaft. Eyeglass frames made of Ni alloy. 4,624,832, Cl. 420-442.000.
Heilmann, Steven M.: *See—*
Katritzky, Alan R.; Cato, Stephen J.; Rasmussen, Jerald K.; Krepski, Larry R.; and Heilmann, Steven M., 4,624,995, Cl. 525-452.000.
Heimann, Ivan: *See—*
Abderhalden, Herbert; Marr, Duncan B.; Heimann, Ivan; and Schmid, Jurg, 4,624,020, Cl. 4-651.000.
Heinrichs, Vern: *See—*
Wilkes, Donald F., 4,624,028, Cl. 16-18.00B.
Heitman, Theodore A., to Dresser Industries, Inc. Assembly for dampening vibration of a glass panel in a vehicle. 4,624,500, Cl. 296-146.000.
Held, Kurt, to Siemens Aktiengesellschaft. A.C. contactor. 4,625,194, Cl. 335-271.000.
Hellier, Edward K.: *See—*
Alber, Norman E.; Dustoor, Manek R.; Hellier, Edward K.; and Scotese, Vito N., 4,624,860, Cl. 427-46.000.
Hemmann, Siglinde: *See—*
Blum, Helmut; and Hemmann, Siglinde, 4,624,947, Cl. 514-108.000.
Hendrickson, Larry L.: *See—*
Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,624,695, Cl. 71-86.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Blum, Helmut; and Hemmann, Siglinde, 4,624,947, Cl. 514-108.000.
Schaper, Ulf-Armin; Streschnak, Benno; Bloesl, Siegfried; and Sommer, Walter, 4,624,802, Cl. 252-522.00R.
Siegers, Hans P., 4,624,668, Cl. 604-904.000.
Henneberg, Helmut H., to Honeywell Information Systems Inc. Tilt base for a CRT display terminal. 4,624,433, Cl. 248-346.000.
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, to Hoechst Aktiengesellschaft. Substituted derivatives of 2-azabicyclo-[3.3.0]octanes. 4,624,962, Cl. 514-412.000.
Hentschel, Christian; and Schmid, Wolfgang, to Hewlett-Packard GmbH. Electro-optic circuit with source control feedback. 4,625,105, Cl. 250-205.000.
Henych, Ivo: *See—*
Fehr, Kurt; Henych, Ivo; and Pavlovsky, Rudolf, 4,624,702, Cl. 75-93.00R.
Hercules Incorporated: *See—*
Berta, Dominic A., 4,624,989, Cl. 525-187.000.
Herliczek, Siegfried H.: *See—*
Ash, Charles E.; Chambers, Scott W.; Jenkins, David R.; and Herliczek, Siegfried H., 4,624,731, Cl. 156-382.000.
Hermann Berstorff Maschinenbau GmbH: *See—*
Naumann, Gerd; and Syrbius, Gerhard, 4,624,854, Cl. 426-233.000.
Hershberg, Robert D., to Genentech, Inc. Purification process for hepatitis surface antigen and product thereof. 4,624,918, Cl. 435-68.000.
Hervais, Vincent: *See—*
Audureau, Joel; Caron, Michel R.; and Hervais, Vincent, 4,624,823, Cl. 264-569.000.
Hessler, John D.; and Eloph, Harry E., Jr., to Essex Group, Inc. Polyester-polyamide tape insulated magnet wire and method of making the same. 4,624,718, Cl. 156-56.000.
Hettche, Albert: *See—*
Balzer, Wolf-Dieter; Lorenz, Klaus; Wolf, Helmut; Trieselt, Wolfgang; Stoeckigt, Dieter; and Hettche, Albert, 4,624,803, Cl. 252-527.000.
Hettinger, William P., Jr.; and Lewis, James E., to Ashland Oil, Inc. Large pore catalysts for heavy hydrocarbon conversion. 4,624,773, Cl. 208-120.000.
Heuvelman, Cornelis, to Zanen Verstoep N.V. Dredge with twin cutter head and suspension therefor. 4,624,066, Cl. 37-65.000.
Hevesi, Jeno ; Gyapai, Janos; Szudy, Gabor; Nagy, Balint; Vago, Arpad; Geszteiyi, Adamne N.; and Keszler, Jozsef, to Nehezvegyipari Kutato Intezet. Apparatus for preparing aqueous and oily, sulfur containing products. 4,624,419, Cl. 241-101.00B.
Hewlett-Packard Company: *See—*
Schrenker, Helge, 4,624,625, Cl. 417-20.000.
Hewlett-Packard GmbH: *See—*
Hentschel, Christian; and Schmid, Wolfgang, 4,625,105, Cl. 250-205.000.
Heyman, Joseph S., to United States of America, National Aeronautics and Space Administration. Double reference pulsed phase locked loop. 4,624,142, Cl. 73-597.000.
Heymes, Alain: *See—*
Dormoy, Jean-Robert; and Heymes, Alain, 4,625,033, Cl. 546-113.000.
Hi-Shear Corporation: *See—*
Wing, George S., 4,624,155, Cl. 74-501.00R.
Hi-Tec Sports Limited: *See—*
Wezel, Frank V.; and Mackness, Terry, 4,624,061, Cl. 36-30.00A.
Hibi, Morihide: *See—*
Sasaki, Tadashi; Fujikawa, Yoshihiro; Sakoda, Ryozo; Sakashita, Mitsuaki; and Hibi, Morihide, 4,624,950, Cl. 514-222.000.
Hidaki, Morihisa, to Toyo Engineering Corporation. Process for refining an ammonia synthesis gas. 4,624,841, Cl. 423-359.000.
Hieke, Klaus: *See—*
Widera, Axel; Schiesal, Alois; Hanser, Walter; Rayer, Peter; and Hieke, Klaus, 4,624,186, Cl. 102-336.000.
Higashi, Robert E.: *See—*
Johnson, Robert G.; and Higashi, Robert E., 4,624,137, Cl. 73-204.000.
Higgins, Raymond L., to NCR Corporation. Video enhancement system. 4,625,330, Cl. 382-27.000.
Higuchi, Kazuhiko: *See—*
Shibano, Takeshi; Sakakura, Yasuyuki; Ito, Kiichi; and Higuchi, Kazuhiko, 4,625,059, Cl. 562-600.000.
Hilal, Said S.: *See—*
Lowery, Guy R.; Hilal, Said S.; Carson, Richard F., Jr.; and Pastrick, Danny L., 4,624,243, Cl. 128-6.000.
Hilborn, Howard L.; and Strebel, Michael, to Gay Engineering & Sales Co., Inc. Heat detection system. 4,625,200, Cl. 340-596.000.
Hill, William J.: *See—*
Silberman, Ira J.; and Hill, William J., 4,624,457, Cl. 272-118.000.
Hillebrand, Donald G.; and Mugford, Donald A., to Chrysler Motors Corporation. Self-restoring energy absorbing bumper mount. 4,624,493, Cl. 293-136.000.
Hilti Aktiengesellschaft: *See—*
Gassner, Theo; and Fehr, Rolf, 4,624,401, Cl. 227-125.000.
Hinkel, Holger; Kaus, Gerhard; Kuenzel, Ulrich; and Schmid, Gerhard, to International Business Machines. Method of making magnetic head sliders. 4,624,048, Cl. 29-603.000.
Hinks, William L.; and Kinstler, John R., to Goodyear Tire & Rubber Company, The. Bar code configuration and method of molding. 4,625,101, Cl. 235-462.000.
Hinton, H. L.; and Harden, Albert J., Jr. Hair curler. 4,624,270, Cl. 132-39.000.
Hioki, Susumu: *See—*
Kohno, Akiomi; Hioki, Susumu; Yamada, Toshihiro; Yokoi, Kazuaki; and Yamamoto, Akihiko, 4,624,403, Cl. 228-122.000.
Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; Asami, Kazutomo; and Sugihara, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Differential pressure lubrication system for rolling piston compressor. 4,624,630, Cl. 418-63.000.
Hirai, Shozo: *See—*
Ohmae, Takashi; Fukaya, Yasuhiro; and Hirai, Shozo, 4,624,404, Cl. 228-198.000.
Hirai, Toshiharu: *See—*
Sato, Goro; Ogata, Masamitsu; and Hirai, Toshiharu, 4,624,936, Cl. 502-65.000.

Hirai, Yutaka: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Osada, Yoshiyuki; Omata, Satoshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,625,224, Cl. 357-23.700.

Hiramatsu, Teruaki, to Nippon Zeon Co., Ltd. Process for controlling distillation column. 4,624,746, Cl. 203-3.000.

Hirao, Takashi: *See*—
Ishihara, Shinichiro; Hirao, Takashi; Mori, Koshiro; Ono, Masaharu; and Kitagawa, Masatoshi, 4,624,045, Cl. 29-572.000.

Hirata, Kouji: *See*—
Amano, Osamu; Kaiya, Atsushi; Tanaka, Takao; Akimura, Hitoshi; Tsujihata, Katsuhiro; and Hirata, Kouji, 4,624,976, Cl. 524-13.000.

Hirose, Masayuki: *See*—
Komiya, Yutaka; Tomosada, Masahiro; Nakamura, Shinichi; Miyata, Masanori; Adachi, Hideki; and Hirose, Masayuki, 4,625,156, Cl. 318-85.000.

Hiruma, Masao; Nakayama, Hiroshi; and Suzuki, Michio, to Honda Giken Kogyo Kabushiki Kaisha. Torsional vibration absorber device. 4,624,650, Cl. 464-26.000.

Hitachi, Ltd.: *See*—
Hayakawa, Takayuki; Nakagawa, Manabu; Fujii, Hideji; and Sato, Shigeru, 4,625,117, Cl. 250-385.000.
Horiuchi, Yuichi, 4,625,219, Cl. 346-108.000.
Kohno, Akiomi; Hioki, Susumu; Yamada, Toshihiro; Yokoi, Kazuaki; and Yamamoto, Akihiko, 4,624,403, Cl. 228-122.000.
Kuwabara, Takao; and Takiguchi, Keitaro, 4,624,622, Cl. 415-14.000.
Kuwabara, Takao, 4,625,125, Cl. 290-52.000.
Nagano, Masami, 4,624,134, Cl. 73-118.200.
Okuyama, Toshiaki; and Kubota, Yuzuru, 4,625,272, Cl. 363-81.000.
Sekihara, Kensuke; Kuroda, Masao; and Kohno, Hideki, 4,625,171, Cl. 324-312.000.
Simada, Tamotu; Harada, Yoshinori; Kambara, Hideki; Nagai, Keiichi; and Tokita, Jirou, 4,624,769, Cl. 204-301.000.
Suzuki, Keizo; Ninomiya, Ken; Nishimatsu, Shigeru; and Okudaira, Sadayuki, 4,624,214, Cl. 118-719.000.
Tukazaki, Hisanobu; Kondo, Kazuo; and Matsumoto, Syuzo, 4,625,322, Cl. 377-58.000.
Umemura, Kaoru; Ishitani, Tohru; Aida, Toshiyuki; and Tamura, Hifumi, 4,624,833, Cl. 420-490.000.
Watanabe, Naomitsu; Tomita, Yoshifumi; Suzuki, Atsushi; and Yamamoto, Hajime, 4,625,147, Cl. 313-468.000.
Watanabe, Yutaka; Kobayashi, Fumiyuki; Ogihara, Satoru; and Ohzawa, Yoshiyuki, 4,624,896, Cl. 428-428.000.
Yamamoto, Etsuji; Matsui, Shigeru; Kuroda, Masuo; and Kohno, Hideki, 4,625,170, Cl. 324-309.000.
Yoshida, Motoko; Itoh, Michio; and Maeda, Kunihiro, 4,624,768, Cl. 204-299.00R.

Hitachi, Ltd: *See*—
Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 4,625,227, Cl. 357-68.000.

Hitachi Maxell, Ltd.: *See*—
Kishimoto, Mikio, 4,624,894, Cl. 428-328.000.
Yamaguchi, Satoru; Satoh, Kozaburoh; Shimizu, Jozo; and Andoh, Haruo, 4,624,883, Cl. 428-212.000.

Hitachi Medical Corporation: *See*—
Hayakawa, Takayuki; Nakagawa, Manabu; Fujii, Hideji; and Sato, Shigeru, 4,625,117, Cl. 250-385.000.

Hitachi Microcomputer Engineering, Ltd.: *See*—
Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 4,625,227, Cl. 357-68.000.

Hitachi Zosen Corporation: *See*—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kanazawa, Tomoyoshi; and Nakagawa, Kenji, 4,624,486, Cl. 285-55.000.

Hitch, Robert J., to W. C. Bradley Company. Universal gas burner with dual adjustable flexible venturi tube assembly for gas-fired barbecue grills. 4,624,240, Cl. 126-41.00R.

Hochstrasser, Jurgen: *See*—
Mathieu, Hans; and Hochstrasser, Jurgen, 4,624,324, Cl. 173-93.000.

Hochstrasser nee Wack, Elisabeth: *See*—
Mathieu, Hans; and Hochstrasser, Jurgen, 4,624,324, Cl. 173-93.000.

Hodogaya Chemical Co., Ltd.: *See*—
Niimura, Isao; Motohashi, Katsuichi; Yamaga, Hiroyoshi; and Akuzawa, Noboru, 4,624,907, Cl. 430-106.000.

Hoebel, Robert E.: *See*—
Morin, Louis G.; and Hoebel, Robert E., 4,624,751, Cl. 204-28.000.

Hoechst Aktiengesellschaft: *See*—
Durckheimer, Walter, 4,624,948, Cl. 514-206.000.
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,624,962, Cl. 514-412.000.
Kruse, Hansjorg; and Kuch, Heinz, 4,624,963, Cl. 514-418.000.
Schmidt, Erwin; and Clauss, Karl, 4,625,024, Cl. 544-2.000.

Hoechst-Roussel Pharmaceuticals: *See*—
Shutske, Gregory M., 4,624,955, Cl. 514-293.000.

Hoesch Maschinenfabrik Deutschland AG: *See*—
Reyer, Manfred; and Schmidts, Klaus, 4,624,730, Cl. 156-358.000.

Hoffman, Glenn A., Jr.: *See*—
Avila, Robert M.; and Hoffman, Glenn A., Jr., 4,624,126, Cl. 72-453.140.

Hoffman, Herbert W.; Cohrs, Richard B.; and Dye, William P., to Van Duprin, Inc. Key-operated, exit alarm, switch cam assembly and modification kit and modification method for switch cam assemblies. 4,624,120, Cl. 70-380.000.

Hoffman, Robert W.: *See*—
Ekchian, Jack A.; Hoffman, Robert W.; and Ekchian, Leon, 4,624,140, Cl. 73-304.00C.

Hoffmann-La Roche Inc.: *See*—
Zurfluh, Rene , 4,625,048, Cl. 560-166.000.

Hofstetter, Edward G., Jr., to American Standard Inc. Control assembly. 4,624,415, Cl. 239-590.300.

Hofstetter, Jean A. Cushion-like support. 4,624,021, Cl. 5-431.000.

Hokusei Nikkei Household Utensils Co., Ltd.: *See*—
Yano, Hiroshi, 4,624,385, Cl. 220-264.000.

Holland, John F.: *See*—
Schindler, Melvin S.; and Holland, John F., 4,624,915, Cl. 435-4.000.

Holland, Karey L.: *See*—
Abrams, Allan D.; Bausmith, Robert C.; Holland, Karey L.; and Holland, Steven P., 4,624,740, Cl. 156-643.000.

Holland, Steven P.: *See*—
Abrams, Allan D.; Bausmith, Robert C.; Holland, Karey L.; and Holland, Steven P., 4,624,740, Cl. 156-643.000.

Hollins, Bryant C., to Exco Industries Ltd. Single log feeder. 4,624,361, Cl. 198-463.500.

Hollmark, Bernt H. F.: *See*—
Hartog, Stefan M.; and Hollmark, Bernt H. F., 4,624,819, Cl. 264-510.000.

Hollowell, William, to American Safety Equipment Corporation. Apparatus for locking safety belt against extensive movement. 4,624,422, Cl. 242-107.200.

Holm, Albert E.; and Dorman, Dennis J., to Testrite, Inc. Method of and apparatus for testing pipe. 4,624,131, Cl. 73-46.000.

Holmes, Robert B., to Milton Roy Company. Logarithmic analog to digital converter. 4,625,197, Cl. 340-347.0AD.

Holscher, Uvo, to Dragerwerk Aktiengesellschaft. Electrochemical measuring cell having an ancillary electrode. 4,624,261, Cl. 128-635.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Akashi, Tomohiko, 4,624,350, Cl. 192-4.00C.
Hiruma, Masao; Nakayama, Hiroshi; and Suzuki, Michio, 4,624,650, Cl. 464-26.000.
Horiuchi, Makoto; and Miyakawa, Yoshitaka, 4,624,107, Cl. 60-547.100.
Nagashima, Tomoyuki, 4,625,264, Cl. 362-72.000.
Nishimura, Sadanori; and Sekine, Noboru, 4,624,105, Cl. 60-361.000.
Niwa, Toshiaki; and Inada, Yukichi, 4,624,501, Cl. 296-222.000.

Honda, Hiroshi: *See*—
Horikoshi, Koki; Kudo, Toshiaki; and Honda, Hiroshi, 4,624,922, Cl. 435-172.300.

Honeywell Inc.: *See*—
Fargo, Richard N., 4,624,282, Cl. 137-599.200.
Jenekhe, Samson A., 4,624,999, Cl. 525-509.000.
Johnson, Robert G.; and Higashi, Robert E., 4,624,137, Cl. 73-204.000.

Honeywell Information Systems Inc.: *See*—
Bashaw, Lawrence D., 4,625,312, Cl. 371-16.000.
Henneberg, Helmut H., 4,624,433, Cl. 248-346.000.

Horecky, Carl J.: *See*—
Cartmell, Robert R.; and Horecky, Carl J., 4,624,836, Cl. 422-115.000.

Horiba, Ltd.: *See*—
Iwashita, Yoshiaki, 4,624,133, Cl. 73-61.10R.
Shimizu, Sumio, 4,624,150, Cl. 73-864.810.

Horii, Masami: *See*—
Ochiai, Kuniaki; Horii, Masami; Komakine, Shigeo; and Tsuyuki, Shinzi, 4,624,589, Cl. 400-124.000.

Horikawa, Norikazu: *See*—
Kawakami, Kenji; Horikawa, Norikazu; and Yamamoto, Yoshinori, 4,625,253, Cl. 360-132.000.

Horikoshi, Koki; Kudo, Toshiaki; and Honda, Hiroshi, to Rikagaku Kenkyusho. Plasmid, method for construction of the same, microorganism carrying the plasmid and method for cultivation of the microorganism. 4,624,922, Cl. 435-172.300.

Horiuchi, Hidenori: *See*—
Kitamura, Goro; Horiuchi, Hidenori; Aoyama, Masaaki; and Ito, Tokuhisa, 4,625,103, Cl. 250-201.000.

Horiuchi, Makoto; and Miyakawa, Yoshitaka, to Nissin Kogyo Kabushiki Kaisha; and Honda Giken Kogyo Kabushiki Kaisha. Hydraulic pressure source device for hydraulic booster of automobile. 4,624,107, Cl. 60-547.100.

Horiuchi, Yuichi, to Hitachi, Ltd. Video signal generating apparatus for laser beam printer. 4,625,219, Cl. 346-108.000.

Hormann KG: *See*—
Hormann, Michael K., 4,625,291, Cl. 364-550.000.

Hormann, Michael K., to Hormann KG. Process for monitoring a driven, movable door or the like. 4,625,291, Cl. 364-550.000.

Horn, Dale W., to Orion Industries, Inc. Antenna mount. 4,625,213, Cl. 343-715.000.

Horn, Reinhard: *See*—
Stotz, Erich; and Horn, Reinhard, 4,624,152, Cl. 74-518.000.

Horton Manufacturing Co., Inc.: *See*—
Hanks, James V.; and Raines, Charles D., 4,624,356, Cl. 192-85.0CA.

Hosaka, Masao: *See*—
Kato, Kenji; and Hosaka, Masao, 4,624,607, Cl. 408-1.00R.

Hoshina, Katsumi: *See*—
Koyama, Masao; Matuo, Syuitu; Nakayama, Chiaki; and Hoshina, Katsumi, 4,624,735, Cl. 156-610.000.

Hosoi, Hideki; Hasegawa, Toshihiko; and Hayashi, Hitoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride polymer composition. 4,624,987, Cl. 525-84.000.
Hospal Industrie: *See*—
Clermont, Christian; de Moncuit, Marc; and Gauckler, Jacques, 4,624,778, Cl. 210-321.300.
Hospitak, Inc.: *See*—
Clark, David W.; and Jablonsky, George J., 4,624,656, Cl. 604-23.000.
Houben, Jan P.: *See*—
Van Rijen, J. G.; and Houben, Jan P., 4,624,078, Cl. 51-170.0MT.
Houck, David L.: *See*—
Port, David J.; Houck, David L.; and Kinney, Frank D., 4,624,700, Cl. 75-0.5BB.
Hoval Interliz AG: *See*—
Ospelt, Gustav, 4,624,216, Cl. 122-17.000.
Howanick, John J.: *See*—
Creedon, Richard L.; and Howanick, John J., 4,624,173, Cl. 89-8.000.
Howard, Harland V., III, to Panama Breakaway, Inc. Spearpoint assembly. 4,624,068, Cl. 43-6.000.
Howell, Henry G.: *See*—
Brundidge, Steven P.; Howell, Henry G.; Sapino, Chester, Jr.; and Tann, Chon-Hong, 4,625,020, Cl. 536-18.200.
Howell, Thomas A.: *See*—
Krechmer, Kenneth R.; Milroy, James C.; Burnett, William R.; and Howell, Thomas A., 4,625,259, Cl. 361-340.000.
Howells, Richard D.: *See*—
Siedle, Allen R.; and Howells, Richard D., 4,625,069, Cl. 568-454.000.
Howland, William A., to Nicolai Company, The. Method of manufacturing a finger-jointed wood panel. 4,624,295, Cl. 144-347.000.
Howmet Turbine Components Corporation: *See*—
Smickley, Robert J.; and Dardi, Louis E., 4,624,714, Cl. 148-3.000.
Hoya Corporation: *See*—
Amano, Satoru, 4,624,534, Cl. 350-358.000.
Izumitani, Tetsuro; Tarumi, Niro; Komiya, Shigeo; and Sawamoto, Takeyuki, 4,625,009, Cl. 526-307.500.
Hsieh, Harry W. S.: *See*—
Rizk, Sidky D.; and Hsieh, Harry W. S., 4,624,996, Cl. 525-453.000.
Rizk, Sidky D.; and Hsieh, Harry W. S., 4,625,012, Cl. 528-28.000.
Hucker, David J., to Sundstrand Corporation. Variable speed constant frequency generating system. 4,625,160, Cl. 322-32.000.
Hudgens, Stephen: *See*—
Yang, Chi C.; Mohr, Ralph; Hudgens, Stephen; Johncock, Annette; and Nath, Prem, 4,624,862, Cl. 427-74.000.
Huels Aktiengesellschaft: *See*—
Springmann, Hermann; and Kosswig, Kurt, 4,625,057, Cl. 562-470.000.
Huetson, Curtis L.: *See*—
Hayden, John R.; and Huetson, Curtis L., 4,624,302, Cl. 165-80.200.
Huff, John P.: *See*—
Frye, Richard D.; Huff, John P.; and Barnette, Rhodes H., 4,624,206, Cl. 114-146.000.
Hughes Aircraft Company: *See*—
Shifrin, Gordon A.; and Welner, Jerome M., 4,624,566, Cl. 356-326.000.
Hughes, David B.: *See*—
DiNitto, Robert S.; Porcher, Thomas C.; Eng, John W.; Namias, Charles S.; and Hughes, David B., 4,625,203, Cl. 340-750.000.
Hughes, Richard: *See*—
Traver, Jack J.; Palmer, C. Dale; and Hughes, Richard, 4,624,306, Cl. 166-53.000.
Huhn, Karl; and Kaufmann, Rudolf, to Wacker-Chemie GmbH. Organopolysiloxanes having Si-bonded hydrogen and SiC-bonded epoxy groups and a process for preparing the same. 4,625,010, Cl. 528-31.000.
Hull Corporation: *See*—
Fay, John M., 4,624,512, Cl. 312-292.000.
Hull, John R.; and Schertz, William W., to United States of America, Energy. Passive-solar directional-radiating cooling system. 4,624,113, Cl. 62-467.000.
Hummel, Peter: *See*—
Kunkel, Fred; Hummel, Peter; Cappel, Bert; Schniggenfittig, Gunther; and Kerber, Helmut, 4,624,183, Cl. 101-365.000.
Humphries, Christopher A. M.: *See*—
Parnaby, John; and Humphries, Christopher A. M., 4,624,132, Cl. 73-55.000.
Humphries, Deborah A.; and von Hungen, Karla J. Impact printer cleaning system. 4,624,593, Cl. 400-702.000.
Hunter, Edwin J. Reversible turbine driven sprinkler unit. 4,624,412, Cl. 239-232.000.
Huntington, John G.: *See*—
Graham, James R.; and Huntington, John G., 4,625,056, Cl. 562-407.000.
Huppert, Raymond H. Tool for removing items from a covered truck bed. 4,624,494, Cl. 294-26.000.
Huret et ses Fils: *See*—
Huret, Gerard, 4,624,151, Cl. 74-491.000.
Huret, Gerard, to Huret et ses Fils. Device for fixing an accessory on a cycle. 4,624,151, Cl. 74-491.000.
Hurley, James R., to Cooper Industries, Inc. Method and apparatus for digitally measuring alternating current. 4,625,283, Cl. 364-487.000.
Hurley, Patrick J.: *See*—
Barnes, Johnny G.; Gaudet, James L.; Hurley, Patrick J.; and Neuman, Grover H., 4,624,591, Cl. 400-171.000.
Hurner, Erwin E. Fuel treatment apparatus. 4,624,779, Cl. 210-180.000.
Hursey, William A. Method and template for circle layouts. 4,624,057, Cl. 33-570.000.
Hurst, Boyd E.: *See*—
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,624,840, Cl. 423-235.000.
Huxford, Teresa D.: *See*—
Lotito, Lawrence A.; Huxford, Teresa D.; and Donaldson, Ann L., 4,625,081, Cl. 379-88.000.
Hydril Company: *See*—
Furgerson, David J., 4,624,488, Cl. 285-334.000.
Hyne, Douglas C. Mast supporting structure. 4,624,208, Cl. 114-345.000.
Hyun, Kun S.: *See*—
Treptow, Warren L.; Park, Chung P.; and Hyun, Kun S., 4,624,969, Cl. 521-60.000.
I.E.M.C.A. S.p.A. Industria Elettromeccanica Complessi Automatici: *See*—
Fabbri, Vladimiro, 4,624,611, Cl. 414-14.000.
Ichimura, Yoshiaki; Kawabe, Natsuki; Hayashi, Haruo; and Uekido, Kouzou, to Japan Aviation Electronics Industry Limited; and NEC Corporation. Coaxial cable connector. 4,624,525, Cl. 339-177.00R.
Ide, Toshiaki: *See*—
Ishizaki, Hideki; Arioka, Hiroyuki; and Ide, Toshiaki, 4,624,892, Cl. 428-323.000.
Idota, Yoshio; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Silver halide diffusion transfer using plural cyclic imide silver halide solvents. 4,624,911, Cl. 430-251.000.
Ierardi, Joseph A.: *See*—
Golder, Willis E.; Ierardi, Joseph A.; Staples, Robert E.; and Boyle, Michael C., 4,625,164, Cl. 324-158.00F.
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, to Tanabe Seiyaku Co., Ltd. Tetrahydro-β-carboline derivatives. 4,625,032, Cl. 546-81.000.
Iijima, Masayuki; and Takahashi, Yoshikazu, to Nihon Shinku Gijutsu Kabushiki Kaisha. Process for forming a synthetic resin film on a substrate and apparatus therefor. 4,624,867, Cl. 427-255.600.
Iimura, Yoshitaka, to Yoshida Kogyo K.K. Method and apparatus for forming upper steps of a concealed type slide fastener. 4,624,809, Cl. 264-23.000.
Ikeda, Yoneichi: *See*—
Miyauchi, Terukatsu; Ikeda, Yoneichi; Nakagawa, Takao; Tsutsui, Toshio; and Kikuchi, Tatsuji, 4,624,807, Cl. 264-12.000.
Ikejima, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for elevator. 4,625,159, Cl. 318-811.000.
Ikeno, Tomohisa; Katayama, Akira; and Obo, Hidefumi, to Nippon Kogaku K. K. Buffer for viewfinder mirror in a single lens reflex camera. 4,624,542, Cl. 354-152.000.
Illinois Tool Works Inc.: *See*—
Baginski, Albert R., 4,624,092, Cl. 52-713.000.
Edwards, Bryant, 4,624,363, Cl. 206-150.000.
Levko, Fred, 4,624,049, Cl. 29-622.000.
Swain, Henry, 4,624,364, Cl. 206-328.000.
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins (P-1026). 4,625,003, Cl. 526-119.000.
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Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, 4,624,935, Cl. 501-134.000.
Imatron, Inc.: *See*—
Rand, Roy E., 4,625,150, Cl. 315-111.310.
Immunomedics, Inc.: *See*—
Goldenberg, Milton D., 4,624,846, Cl. 424-1.100.
Imperial Chemical Industries PLC: *See*—
Boyle, Francis T., 4,625,036, Cl. 548-262.000.
Cogswell, Frederic N.; and Measuria, Umakant, 4,624,886, Cl. 428-245.000.
Ellis, Alfred G., 4,624,212, Cl. 118-19.000.
Imperial Clevite Inc.: *See*—
Alber, Norman E.; Dustoor, Manek R.; Hellier, Edward K.; and Scotese, Vito N., 4,624,860, Cl. 427-46.000.
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Niwa, Toshiaki; and Inada, Yukichi, 4,624,501, Cl. 296-222.000.
Inaguma, Hideo, to Yamauchi Rubber Industry Co., Ltd. Method for manufacturing a rubber roller for spinning. 4,624,723, Cl. 156-185.000.
Inco Alloys International, Inc.: *See*—
Badia, Frank A., 4,624,706, Cl. 75-246.000.
Jatkar, Arun D.; Gilman, Paul S.; and Benn, Raymond C., 4,624,705, Cl. 75-239.000.
Inland Steel Company: *See*—
Nickola, Richard A., 4,624,895, Cl. 428-335.000.
Inmont Corporation: *See*—
Hays, Byron G., 4,625,018, Cl. 534-724.000.
Inoue, Jiro. Diamond saw. 4,624,237, Cl. 125-15.000.
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Saito, Kengo; Ohtsu, Yasunori; Akahira, Isao; and Inoue, Makoto, 4,625,247, Cl. 360-71.000.
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the preparation of dicarboxylic acid using microorganism. 4,624,920, Cl. 435-142.000.
Inouye, Masayori; and Nakamura, Kenzo, to Research Foundation of State University of New York, The. Novel cloning vehicles for polypeptide expression in microbial hosts. 4,624,926, Cl. 435-253.000.
Institut Francais du Petrole: *See—*
Rojey, Alexandre, 4,624,305, Cl. 165-165.000.
Institut Pasteur: *See—*
Relyveld, Edgar H., 4,625,019, Cl. 536-6.400.
Integrated Flow Systems, Inc.: *See—*
Eidsmore, Paul G., 4,624,443, Cl. 251-65.000.
Intermedicat GmbH: *See—*
Mardorf, Robert; and von der Haar, Friedrich, 4,624,658, Cl. 604-121.000.
Intermedics, Inc.: *See—*
Baker, Ross G., Jr.; Calfee, Richard V.; Sanders, Richard S.; Vandegriff, Joe; and Warren, Jay, 4,624,260, Cl. 128-419.0PG.
International Anasazi, Inc.: *See—*
Biffle, Lewis L.; and Larson, Chad R., 4,625,077, Cl. 379-28.000.
International Business Machines: *See—*
Hinkel, Holger; Kaus, Gerhard; Kuenzel, Ulrich; and Schmid, Gerhard, 4,624,048, Cl. 29-603.000.
International Business Machines Corporation: *See—*
Abrams, Allan D.; Bausmith, Robert C.; Holland, Karey L.; and Holland, Steven P., 4,624,740, Cl. 156-643.000.
Barnes, Johnny G.; Gaudet, James L.; Hurley, Patrick J.; and Neuman, Grover H., 4,624,591, Cl. 400-171.000.
Bassetti, Larry W.; Kantor, Sherwood; and Richert, Janis K., 4,625,222, Cl. 346-160.000.
Champion, James R.; and Yeager, Clarke A., 4,625,176, Cl. 324-458.000.
Nixon, Paul E.; Polavarapu, Murty S.; and Stanasolovich, David, 4,624,739, Cl. 156-643.000.
Purcell, Billy D., 4,624,592, Cl. 400-208.000.
International Immunoassay Laboratories, Inc.: *See—*
Shah, Vipin D.; and Shah, Nila V., 4,624,916, Cl. 435-7.000.
International Standard Electric Corporation: *See—*
Epworth, Richard E., 4,625,305, Cl. 370-1.000.
Kornaker, Walter, 4,625,144, Cl. 313-412.000.
Nestel, Siegfried; and Bohm, Manfred, 4,625,108, Cl. 250-227.000.
Weeks, Ronald D.; and Croney, David J., 4,625,261, Cl. 361-433.000.
Irie, Yoshio: *See—*
Tsubakimoto, Tsuneo; Shimomura, Tadao; and Irie, Yoshio, 4,625,001, Cl. 526-88.000.
Irmer, Siegfried, to Move-Werk GmbH & Co. KG. Woven cotton fabric and its preparation. 4,624,675, Cl. 8-115.600.
Ishiguro, Hiroyuki: *See—*
Yamada, Tetsusyo; Kojima, Takao; Ishiguro, Hiroyuki; and Nakayama, Yutaka, 4,624,770, Cl. 204-428.000.
Ishiguro, Kazuyoshi; and Araki, Hidemoto, to Kabushiki Kaisha Tokairika-denki-seisakusho. Buckle apparatus. 4,624,034, Cl. 24-641.000.
Ishihara, Hideaki: *See—*
Kurita, Kazuo; and Ishihara, Hideaki, 4,624,816, Cl. 264-210.700.
Ishihara, Hideo: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,625,172, Cl. 324-326.000.
Ishihara, Shinichiro; Hirao, Takashi; Mori, Koshiro; Ono, Masaharu; and Kitagawa, Masatoshi, to Matsushita Electric Industrial Co., Ltd. Method of making thin film device. 4,624,045, Cl. 29-572.000.
Ishii, Keizou: *See—*
Kuwajima, Teruaki; Ishii, Keizou; Miwa, Hiroshi; and Ishikura, Shinichi, 4,624,973, Cl. 523-221.000.
Ishii, Susumu; and Oda, Kiyoshi, to Yoshida Kogyo K. K. Slide fastener slider with detachable pull tab. 4,624,032, Cl. 24-429.000.
Ishijima, Koji: *See—*
Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; Asami, Kazutomo; and Sugihara, Masahiro, 4,624,630, Cl. 418-63.000.
Ishikawa, Hiroshi; Matsui, Kazuma; Kurahashi, Takashi; Akatsuka, Hidehiko; and Yamada, Motokazu, to Nippondenso Co., Ltd. Position analyzer for vehicle drivers. 4,625,329, Cl. 382-1.000.
Ishikura, Shinichi: *See—*
Kuwajima, Teruaki; Ishii, Keizou; Miwa, Hiroshi; and Ishikura, Shinichi, 4,624,973, Cl. 523-221.000.
Ishitani, Tohru: *See—*
Umemura, Kaoru; Ishitani, Tohru; Aida, Toshiyuki; and Tamura, Hifumi, 4,624,833, Cl. 420-490.000.
Ishizaka, Sunao; and Maida, Osamu, to Nippon Kogaku K. K. Film speed setting device for camera. 4,624,540, Cl. 354-21.000.
Ishizaki, Hideki; Arioka, Hiroyuki; and Ide, Toshiaki, to TDK Corporation. Magnetic recording medium. 4,624,892, Cl. 428-323.000.
Isoda, Yoritaka: *See—*
Ono, Hirofumi; Tsujimura, Kiyoharu; Kamo, Masayuki; and Isoda, Yoritaka, 4,624,138, Cl. 73-204.000.
Isogai, Hideaki; and Fukushi, Isao, to Fujitsu Limited. Bipolar random access memory. 4,625,299, Cl. 365-189.000.
Istituto Biochimico Italiano Giovanni Lorenzini S.p.A.: *See—*
Valcavi, Umberto; Farina, Paolo; and Marotta, Vittorio, 4,625,021, Cl. 540-230.000.
Itaya, Eiji; Takano, Takeshi; and Nakamura, Takaharu, to Fujitsu Limited. Intermittently operated frequency synthesizer having suppressed frequency instability. 4,625,180, Cl. 331-2.000.
Itaya, Masahiko: *See—*
Haneda, Satoshi; Itaya, Masahiko; and Tomono, Makoto, 4,624,559, Cl. 355-14.00D.
Itkis, Yuri: Electronic card and board game. 4,624,462, Cl. 273-237.000.
Ito, Kiichi: *See—*
Shibano, Takeshi; Sakakura, Yasuyuki; Ito, Kiichi; and Higuchi, Kazuhiko, 4,625,059, Cl. 562-600.000.
Ito, Masanobu: *See—*
Mori, Shunji; and Ito, Masanobu, 4,625,285, Cl. 364-513.000.
Ito, Masaya, to NGK Spark Plug Co., Ltd. Clad brazing filler for bonding ceramic to metal, glass, or other ceramic and composites using such filler. 4,624,897, Cl. 428-432.000.
Ito, Nobuo; and Tajima, Masashi, to Kabushiki Kaisha Toshiba. Combined coffee grinding and brewing machine. 4,624,177, Cl. 99-286.000.
Ito, Satoru: *See—*
Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 4,625,227, Cl. 357-68.000.
Ito, Tokuhisa: *See—*
Kitamura, Goro; Horiuchi, Hidenori; Aoyama, Masaaki; and Ito, Tokuhisa, 4,625,103, Cl. 250-201.000.
Itoh, Hiroshi; and Okada, Mituhiko, to Toyota Jidosha Kabushiki Kaisha. Continuously variable transmission. 4,624,153, Cl. 74-689.000.
Itoh, Michio: *See—*
Yoshida, Motoko; Itoh, Michio; and Maeda, Kunihiro, 4,624,768, Cl. 204-299.00R.
ITT Corporation: *See—*
Anhalt, John W.; and Goodman, David S., 4,624,517, Cl. 339-75.00M.
Beery, Jack, 4,624,560, Cl. 355-27.000.
Sande, Walter E.; Stroud, Barrie D.; and Dumdie, Dan P., 4,624,745, Cl. 162-252.000.
ITT Industries, Inc.: *See—*
Micic, Ljubomir; Burth, Rolf D.; Fischer, Thomas; and Schweer, Rainer, 4,625,153, Cl. 315-370.000.
Iwami, Yoshiyuki: *See—*
Oberndorfer, Johannes; Ono, Kenji; and Iwami, Yoshiyuki, 4,625,191, Cl. 335-78.000.
Iwamoto, Kenzi: *See—*
Saito, Kimitaka; Iwamoto, Kenzi; Obayashi, Hideki; and Matuyama, Takeshi, 4,624,232, Cl. 123-489.000.
Iwamoto, Yoshinao: *See—*
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,625,172, Cl. 324-326.000.
Iwashita, Yoshiaki, to Horiba, Ltd. Apparatus for determining the concentration of oil in another liquid. 4,624,133, Cl. 73-61.10R.
Iwata, Fumio; Harada, Katsumasa; and Sugise, Ryoji, to Ube Industries, Ltd. Process for producing a 2H-1,3-thiazolidine, 2H-tetrahydro-1,3-thiazine, or 2H-hexahydro-1,3-thiazepine derivative substituted at the 2 position by a nitromethylene group derivative. 4,625,025, Cl. 544-53.000.
Iwata, Tetsuya, to Alps Electric Co., Ltd. Head holding mechanism of magnetic disk device. 4,625,249, Cl. 360-104.000.
Izumitani, Tetsuro; Tarumi, Niro; Komiya, Shigeo; and Sawamoto, Takeyuki, to Hoya Corporation. High-hydration contact lens. 4,625,009, Cl. 526-307.500.
J. C. Kinley Company: *See—*
Kinley, Karl S., 4,624,307, Cl. 166-55.300.
J. D. Phillips Corporation: *See—*
Phillips, James D.; and Sheets, Robert L., 4,624,610, Cl. 409-132.000.
J. I. Case Company: *See—*
Mickelson, Roger D.; and Brown, Thomas R., 4,624,106, Cl. 60-452.000.
J. T. Baker Chemical Company: *See—*
Schwartzkopf, George, 4,624,908, Cl. 430-192.000.
Jablonsky, George J.: *See—*
Clark, David W.; and Jablonsky, George J., 4,624,656, Cl. 604-23.000.
Jaccod, Michel, to Valeo. Variable speed drive pulley. 4,624,651, Cl. 474-13.000.
Jackel, Gernot: *See—*
Heidsiek, Horst; Jackel, Gernot; and Becker, Horst, 4,624,832, Cl. 420-442.000.
Jackson, Dawn A., to Standard Telephones and Cables, Public Limited Co. Ceramic capacitors and dielectric compositions. 4,625,258, Cl. 361-321.000.
Jackson, Leigh F., to Westinghouse Electric Corp. Nuclear fuel assembly channel spring and stop assembly and method of using same. 4,624,829, Cl. 376-448.000.
Jacobson, Chester F.: *See—*
Apprille, Domenic V., Jr.; Chesnauskas, Ralph J.; Jacobson, Chester F.; and Trotta, Robert A., 4,624,051, Cl. 30-50.000.
Jaeger, Robert P., to Sierracin Corporation. Patterned conductive ink touch panel. 4,625,075, Cl. 178-18.000.
Jahn, Dieter: *See—*
Keil, Michael; Becker, Rainer; Jahn, Dieter; Kolassa, Dieter; Schirmer, Ulrich; Will, Wolfgang; Wuerzer, Bruno; and Meyer, Norbert, 4,624,696, Cl. 71-88.000.
Jakobsson, Klas, to Bilskade-Service HB. Arrangement for use with blasting equipment. 4,624,080, Cl. 51-410.000.
James L. Taylor Mfg. Co.: *See—*
Mortoly, John L., 4,624,451, Cl. 269-71.000.

James Walker & Co.,: *See*—
Goulding, Leslie B.; and Johnson, Ian F., 4,624,880, Cl. 428-143.000.
Janhonen, Veikko I. Package and method for fabrication thereof. 4,624,407, Cl. 229-1.50R.
Janome Sewing Machine Co., Ltd.: *See*—
Kato, Kenji; and Hosaka, Masao, 4,624,607, Cl. 408-1.00R.
Janutta, Reinhard, to Hauni-Werke Korber & Co. KG. Turn-around mechanism for workpieces in grinding machines. 4,624,081, Cl. 51-98.500.
Japan Aviation Electronics Industry Limited: *See*—
Ichimura, Yoshiaki; Kawabe, Natsuki; Hayashi, Haruo; and Uekido, Kouzou, 4,624,525, Cl. 339-177.00R.
Japan Synthetic Rubber Co., Ltd.: *See*—
Miyabayashi, Toshio; Sakabe, Nobuyuki; Udagawa, Yoshiyuki; Enyo, Hiroji; and Takemura, Yasuhiko, 4,625,005, Cl. 526-273.000.
Jarzombek, Richard E.; and Moeller, Raymond J., to Bee Chemical Co. Liquid colorant/additive concentrate for plastics. 4,624,983, Cl. 524-474.000.
Jatkar, Arun D.; Gilman, Paul S.; and Benn, Raymond C., to Inco Alloys International, Inc. Mechanical alloying. 4,624,705, Cl. 75-239.000.
Jedziniak, Francis J. Storage assembly for data processing device. 4,624,510, Cl. 312-252.000.
Jellinek, Frank H.: *See*—
Melisz, John M.; and Jellinek, Frank H., 4,624,882, Cl. 428-210.000.
Jenekhe, Samson A., to Honeywell Inc. Electrically conducting complexes of polymers of N-substituted carbazoles and substituted benzaldehydes. 4,624,999, Cl. 525-509.000.
Jenkins, David R.: *See*—
Ash, Charles E.; Chambers, Scott W.; Jenkins, David R.; and Herliczek, Siegfried H., 4,624,731, Cl. 156-382.000.
Jensen, Marten C., to Clark, Richard W., a part interest. Sound pattern discrimination system. 4,625,206, Cl. 340-902.000.
Jeromin, Lothar S., to Xerox Corporation. Automatic xerographic plate development system. 4,624,544, Cl. 355-3.00R.
Jewell, Charles F., Jr.; and Wareing, James R., to Sandoz Pharm. Corp. 4-trisubstituted silyl protected hydroxy-6-oxo-tetrahydropyran-2-yl-aldehyde intermediates. 4,625,039, Cl. 349-214.000.
Jewell, Lisle A.: *See*—
Levad, Thomas M.; and Jewell, Lisle A., 4,624,614, Cl. 414-95.000.
JGC Corporation: *See*—
Yamanaka, Akihiro; Toshikuni, Masami; and Suzuki, Kazunori, 4,624,792, Cl. 210-759.000.
Jirkovsky, Ivo; King, Gary; Baudy, Reinhardt; and DeNoble, Victor, to American Home Products Corporation. 6,7,8,9-tetrahydro-10-methylpyrido[1,2-a]indol-9-amines and derivatives thereof, useful for the treatment of cognitive impairments. 4,624,954, Cl. 514-290.000.
Joe, Do S. Cookware having integrally formed natural stone bottoms and method of manufacturing the same. 4,625,098, Cl. 219-462.000.
John Blue Company: *See*—
Johnston, Douglas, 4,624,193, Cl. 111-6.000.
John, Vivian B.: *See*—
Cooke, David J.; Griffiths, Brian J.; John, Vivian B.; and Sawicki, George C., 4,624,794, Cl. 252-8.800.
Johncock, Annette: *See*—
Yang, Chi C.; Mohr, Ralph; Hudgens, Stephen; Johncock, Annette; and Nath, Prem, 4,624,862, Cl. 427-74.000.
Johnson, Delmar R., to Bell & Howell Company. Microimage recorder. 4,624,558, Cl. 355-100.000.
Johnson, Dwight N., to Masco Corporation. Control stop for flushing system. 4,624,444, Cl. 251-121.000.
Johnson, Ian F.: *See*—
Goulding, Leslie B.; and Johnson, Ian F., 4,624,880, Cl. 428-143.000.
Johnson, James D.; and Kamp, Terrence A., to Reliance Electric Company. Flanged bushing mounting adaptor. 4,624,597, Cl. 403-16.000.
Johnson, John L., to United States of America, Army. Wide field of view remote laser position sensor. 4,624,563, Cl. 356-152.000.
Johnson, Robert G.; and Higashi, Robert E., to Honeywell Inc. Semiconductor device. 4,624,137, Cl. 73-204.000.
Johnston, Douglas, to John Blue Company. Method and apparatus for the jet injection of agricultural liquids into the soil. 4,624,193, Cl. 111-6.000.
Jokel, Isidore. Device for marking cars. 4,624,211, Cl. 116-209.000.
Jones, Howell A.: *See*—
Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward C., 4,625,282, Cl. 364-466.000.
Jones, Michael H.: *See*—
Baron, Richard D.; Jones, Michael H.; and Kent, David E., 4,624,395, Cl. 222-129.100.
Jordan, William D.; and Clemens, Donald L., to Thermalloy Incorporated. Fasteners for surface mounting of printed circuit board components. 4,625,260, Cl. 361-386.000.
Jorgensen, Jorgen A.; Nygren, Donald W.; Kluge, Douglas J.; and Traun, Jerel P., to Northland Aluminum Products, Inc. Portable turntable for use in microwave ovens. 4,625,087, Cl. 219-10.55F.
Jung, Guenter: *See*—
Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,625,116, Cl. 250-363.00S.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Sugimoto, Kaname, 4,624,917, Cl. 435-68.000.
Kabushiki Kaisha Iseki Kaihatsu Koki: *See*—
Akesaka, Toshio, 4,624,605, Cl. 405-144.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Naito, Kazufumi, 4,624,331, Cl. 177-185.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Murakami, Tsudoi; and Nagahama, Yasuhide, 4,624,621, Cl. 414-735.000.
Kabushiki Kaisha Okawara Seisakusho: *See*—
Nakayasu, Morihiro; Tomizawa, Takekazu; and Sugiura, Toshiharu, 4,624,058, Cl. 34-10.000.
Kabushiki Kaisha Tokai-rika-denki-seisakusho: *See*—
Ishiguro, Kazuyoshi; and Araki, Hidemoto, 4,624,034, Cl. 24-641.000.
Kabushiki Kaisha Toshiba: *See*—
Danno, Yuji; and Kawashima, Kouzou, 4,625,149, Cl. 313-623.000.
Fukushi, Yukihiro; and Segawa, Hiroyuki, 4,624,546, Cl. 355-14.00R.
Ito, Nobuo; and Tajima, Masashi, 4,624,177, Cl. 99-286.000.
Karino, Hisao, 4,625,086, Cl. 219-10.55B.
Komatsubara, Tadashi; and Sadamasa, Tetsuo, 4,625,223, Cl. 357-17.000.
Miwa, Yoshiyuki, 4,625,097, Cl. 219-441.000.
Ohzeki, Kazuo, 4,625,241, Cl. 358-147.000.
Kabushiki Kaisha Yakult Honsha: *See*—
Endo, Akira, 4,624,924, Cl. 435-220.000.
Kageyama, Satoru: *See*—
Tsutsumi, Shuji; Yamaguchi, Yoshirou; and Kageyama, Satoru, 4,624,985, Cl. 524-803.000.
Kaisei Kogyo Corporation: *See*—
Suezaki, Yasunaga, 4,624,293, Cl. 144-2.00Z.
Kaiya, Atsushi: *See*—
Amano, Osamu; Kaiya, Atsushi; Tanaka, Takao; Akimura, Hitoshi; Tsujihata, Katsuhiro; and Hirata, Kouji, 4,624,976, Cl. 524-13.000.
Kajiwara, Akiharu: *See*—
Yamamoto, Masaichi; Araki, Seiichi; Yamamoto, Hiroshi; Yamatsu, Isao; Suzuki, Takeshi; Kajiwara, Akiharu; Suzuki, Yoshikazu; and Arai, Haruyoshi, 4,624,966, Cl. 514-724.000.
Kakilashvili, Isaak; and Kakilashvili, Shalva. Shuttle unit of a loom. 4,624,287, Cl. 139-134.000.
Kakilashvili, Shalva: *See*—
Kakilashvili, Isaak; and Kakilashvili, Shalva, 4,624,287, Cl. 139-134.000.
Kaleta, Gary S., to Gunderson, Inc. Stack supporting container car. 4,624,188, Cl. 105-355.000.
Kallay nee Sohonyai, Anna: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.
Kallioinen, Jouko O.; Vahasarja, Tauno J.; and Repo, Arvo, to Outokumpu Oy. Flotation machine. 4,624,777, Cl. 209-170.000.
Kaltenbach, Robert P.: *See*—
Lueckenotte, Donald L.; and Kaltenbach, Robert P., 4,624,685, Cl. 55-13.000.
Kamata, Yoshikiyo, to Kioritz Corporation. Crankshaft assembly. 4,624,156, Cl. 74-595.000.
Kambara, Hideki: *See*—
Simada, Tamotu; Harada, Yoshinori; Kambara, Hideki; Nagai, Keiichi; and Tokita, Jirou, 4,624,769, Cl. 204-301.000.
Kamo, Masayuki: *See*—
Ono, Hirofumi; Tsujimura, Kiyoharu; Kamo, Masayuki; and Isoda, Yoritaka, 4,624,138, Cl. 73-204.000.
Kamp, Terrence A.: *See*—
Johnson, James D.; and Kamp, Terrence A., 4,624,597, Cl. 403-16.000.
Kamperman, David R.; Lancy, Leslie E.; and Swank, Claire A., to Lancy International, Inc. Reduction of metal content of treated effluents. 4,624,790, Cl. 210-665.000.
Kanamaru, Hitoshi; Funabashi, Tadashi; Takahashi, Junji; and Kato, Kyoichi, to Pioneer Electronic Corp. Automatic loading disc player. 4,625,304, Cl. 369-75.200.
Kanao, Shiro. Underground drain pipe. 4,624,603, Cl. 405-49.000.
Kanazawa, Tomoyoshi: *See*—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kanazawa, Tomoyoshi; and Nakagawa, Kenji, 4,624,486, Cl. 285-55.000.
Kanda, Yohichi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.
Kanda, Youichi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kanda, Youichi; Satake, Keigo; Yamazaki, Shiro; and Chida, Tsuneaki, 4,624,698, Cl. 71-90.000.
Kane, Lawrence M., to Daig Corporation. Introducer tool for screw-in lead. 4,624,266, Cl. 128-785.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Hosoi, Hideki; Hasegawa, Toshihiko; and Hayashi, Hitoshi, 4,624,987, Cl. 525-84.000.
Takahashi, Satomi; Ueda, Yasuyoshi; Shimada, Yoshio; and Watanabe, Kiyoshi, 4,625,042, Cl. 549-401.000.
Kaneko, Toshio: *See*—
Yasuda, Wataru; Sakamoto, Koji; Kaneko, Toshio; and Kanno, Fuchio, 4,624,545, Cl. 355-3.0DD.

Kanngiesser, Karl-Werner, to BBC Aktiengesellschaft Brown, Boveri & Cie. High voltage D-C transmission power station with a generator transformer. 4,625,269, Cl. 363-35.000.

Kanno, Fuchio: *See*—
Yasuda, Wataru; Sakamoto, Koji; Kaneko, Toshio; and Kanno, Fuchio, 4,624,545, Cl. 355-3.0DD.

Kansas State University Research Foundation: *See*—
Fan, Liang-tseng; and Mathews, Alexander P., 4,624,789, Cl. 210-661.000.

Kantor, Sherwood: *See*—
Bassetti, Larry W.; Kantor, Sherwood; and Richert, Janis K., 4,625,222, Cl. 346-160.000.

Kao Corporation: *See*—
Yokota, Yukinaga; Sawamoto, Yuji; Taniguchi, Hideki; and Okabe, Kazuhiko, 4,625,063, Cl. 564-480.000.

Kapolnas nee Pap, Marta: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.

Karino, Hisao, to Kabushiki Kaisha Toshiba. Cooking apparatus capable of displaying the ratio of elapsed cooking time to pre-set time. 4,625,086, Cl. 219-10.55B.

Karlotski, Robert J.: *See*—
Keeffe, William M.; Krasko, Zeya K.; and Karlotski, Robert J., 4,625,141, Cl. 313-25.000.

Kasabian, George, to Garrett Corporation, The. Permanent magnet rotor. 4,625,135, Cl. 310-156.000.

Kashimoto, Masaaki: *See*—
Sahara, Masanori; Nishida, Takumi; Sado, Osamu; and Kashimoto, Masaaki, 4,624,228, Cl. 123-378.000.

Kashiwagi, Kazuo: *See*—
Endo, Makoto; Ono, Satoshi; Toda, Takao; Kashiwagi, Kazuo; Yanagi, Masaaki; and Saito, Yoshihiro, 4,624,547, Cl. 355-14.00E.

Kasperkovitz, Wolfdietrich G.; and Dullemond, Dirk J., to U.S. Philips Corporation. Attenuator circuit. 4,625,131, Cl. 307-540.000.

Kataoka, Hiroyuki, to Canon Kabushiki Kaisha. Flash device with back-up capacitor voltage supply. 4,625,151, Cl. 315-241.00P.

Katayama, Akira: *See*—
Ikeno, Tomohisa; Katayama, Akira; and Obo, Hidefumi, 4,624,542, Cl. 354-152.000.

Kato, Kenji; and Hosaka, Masao, to Janome Sewing Machine Co., Ltd. Computed numerical control drilling machine. 4,624,607, Cl. 408-1.00R.

Kato, Kyoichi: *See*—
Kanamaru, Hitoshi; Funabashi, Tadashi; Takahashi, Junji; and Kato, Kyoichi, 4,625,304, Cl. 369-75.200.

Kato, Masao: *See*—
Matsuda, Hiro; Nakanishi, Hachiro; Kato, Masao; Orihashi, Yuji; Kobayashi, Norihisa; and Tsuchida, Eishun, 4,624,756, Cl. 204-59.00R.

Kato, Shigeaki: *See*—
Kokusho, Yoshitaka; Kato, Shigeaki; and Machida, Haruo, 4,624,919, Cl. 435-74.000.

Kato, Tadashi: *See*—
Fujimori, Hiroyoshi; Nagasaki, Tatsuo; Kato, Tadashi; and Sasaki, Masahiko, 4,625,236, Cl. 358-98.000.

Katoh, Itsurou, to Sharp Kabushiki Kaisha. Copying machine with easy removal of image transfer member. 4,624,549, Cl. 355-3.0BE.

Katritzky, Alan R.; Cato, Stephen J.; Rasmussen, Jerald K.; Krepski, Larry R.; and Heilmann, Steven M., to Minnesota Mining and Manufacturing Company. Triazolinethione-containing polymer. 4,624,995, Cl. 525-452.000.

Katz, Maurice, to Creusot-Loire. Multi-ratio hydraulic energy dissipater. 4,624,346, Cl. 188-282.000.

Katz, Robert: *See*—
Katz, Sidney; and Katz, Robert, 4,624,184, Cl. 101-375.000.

Katz, Sidney; and Katz, Robert. Annular expansible heads for a printing cylinder assembly. 4,624,184, Cl. 101-375.000.

Kaufman, Benjamin J.: *See*—
Sung, Rodney L.; and Kaufman, Benjamin J., 4,624,682, Cl. 44-71.000.

Kaufman, Clarence D., to Bally Manufacturing Corporation. Gaming device having random multiple payouts. 4,624,459, Cl. 273-143.00R.

Kaufmann, Rudolf: *See*—
Huhn, Karl; and Kaufmann, Rudolf, 4,625,010, Cl. 528-31.000.

Kaulig, Heinz; and Stein, Klaus, to Stein & Co. GmbH. Protective device for floor cleaning apparatus. 4,624,025, Cl. 15-41.00R.

Kaus, Gerhard: *See*—
Hinkel, Holger; Kaus, Gerhard; Kuenzel, Ulrich; and Schmid, Gerhard, 4,624,048, Cl. 29-603.000.

Kawabe, Natsuki: *See*—
Ichimura, Yoshiaki; Kawabe, Natsuki; Hayashi, Haruo; and Uekido, Kouzou, 4,624,525, Cl. 339-177.00R.

Kawaguchi, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Superconducting apparatus with improved current lead-in. 4,625,192, Cl. 335-216.000.

Kawaguchi, Toshiyuki; Nogami, Takashi; and Nei, Koichi, to Shin-Etsu Polymer Co., Ltd. Anisotropically electroconductive adhesive. 4,624,801, Cl. 252-500.000.

Kawakami, Kenji; Horikawa, Norikazu; and Yamamoto, Yoshinori, to Sony Corporation. Magnetic tape cassette. 4,625,253, Cl. 360-132.000.

Kawamura, Takao; Nakayama, Yoshikazu; and Akiyama, Koji, to Kyocera Corporation; and Kawamura, Takao. Electrophotographic sensitive member having a fluorinated amorphous silicon photoconductive layer. 4,624,906, Cl. 430-84.000.

Kawaoka, Tsukasa: *See*—
Okamoto, Tatsuaki; Miyaguchi, Shoji; Shiraishi, Akira; and Kawaoka, Tsukasa, 4,625,076, Cl. 178-22.110.

Kawasaki Steel Corporation: *See*—
Yasuda, Koichi; Nakano, Syozaburo; and Nishiyama, Noboru, 4,624,406, Cl. 228-263.150.

Kawashima, Kouzou: *See*—
Danno, Yuji; and Kawashima, Kouzou, 4,625,149, Cl. 313-623.000.

Kay, Frank: *See*—
Franke, Rudiger; Weiss, Aby; Goergen, Hans; Niemann-Delius, Christian; and Kay, Frank, 4,624,504, Cl. 299-18.000.

Kay, Jack R.: *See*—
Smyers, Michael K.; and Kay, Jack R., 4,625,091, Cl. 219-86.240.

Kayahara, Takehiko: *See*—
Yuzawa, Keiji; Matsumoto, Naoaki; Kayahara, Takehiko; Tateishi, Naofumi; and Fukuda, Makoto, 4,624,171, Cl. 84-1.030.

Kayser-Roth Hosiery, Inc.: *See*—
Safrit, Sam C.; Farrell, Roscoe M.; and Euliss, Melvin C., 4,624,115, Cl. 66-172.00R.

Kazmaier, Peter M.; Burt, Richard A.; and Baranyi, Giuseppa, to Xerox Corporation. Photoconductive imaging members with unsymmetrical squaraine compounds containing an hydroxyl group. 4,624,904, Cl. 430-59.000.

Kazunori, Hashimoto, to Tachikawa Spring Co. Ltd. Frame for a vehicle seat. 4,624,503, Cl. 297-452.000.

Keating, Richard. Protective cover for temperature control. 4,624,178, Cl. 99-337.000.

Keeffe, William M.; Krasko, Zeya K.; and Karlotski, Robert J., to GTE Products Corporation. Low wattage metal halide discharge lamp electrically biased to reduce sodium loss. 4,625,141, Cl. 313-25.000.

Keil, Joseph W., to Dow Corning Corporation. Silicone-modified epoxy resins having improved impact resistance. 4,624,998, Cl. 525-476.000.

Keil, Michael; Becker, Rainer; Jahn, Dieter; Kolassa, Dieter; Schirmer, Ulrich; Will, Wolfgang; Wuerzer, Bruno; and Meyer, Norbert, to BASF Aktiengesellschaft. Cyclohexenone derivatives and their use for controlling undesirable plant growth. 4,624,696, Cl. 71-88.000.

Kelledes, William L.; and O'Neil, Walter K., to Eaton Corporation. Electric power assisted steering system. 4,624,334, Cl. 180-79.100.

Keller, Bobby R., to Westinghouse Electric Corp. Lathe for machining balloon-shaped pockets in a workpiece. 4,624,158, Cl. 82-12.000.

Keller, Harold T., deceased: *See*—
Cheng, Wenche W.; Stoner, Donald R.; and Keller, Harold T., deceased, 4,624,866, Cl. 427-190.000.

Keller, Patricia A., administratrix: *See*—
Cheng, Wenche W.; Stoner, Donald R.; and Keller, Harold T., deceased, 4,624,866, Cl. 427-190.000.

Kelly, Michael B., to Standard Telephones & Cables Public Limited Co. Local area network communications system for maintaining service in the event of a fault. 4,625,082, Cl. 379-273.000.

Kelsey, Donald R.: *See*—
Chao, Herbert S.; and Kelsey, Donald R., 4,625,000, Cl. 525-534.000.

Kemp, Richard A., to Shell Oil Company. Process for producing wide-pore catalyst supports. 4,624,938, Cl. 502-208.000.

Kenichiro, Yamanishi: *See*—
Akira, Shuhara; Kenichiro, Yamanishi; and Yoshibumi, Minowa, 4,624,859, Cl. 427-38.000.

Kenney, James W., to Drummond Scientific Company. Pipet gun for drawing liquid into and expelling it from a pipet. 4,624,147, Cl. 73-864.150.

Kent, David E.: *See*—
Baron, Richard D.; Jones, Michael H.; and Kent, David E., 4,624,395, Cl. 222-129.100.

Kerber, Helmut: *See*—
Kunkel, Fred; Hummel, Peter; Cappel, Bert; Schniggenfittig, Gunther; and Kerber, Helmut, 4,624,183, Cl. 101-365.000.

Kercher, David M., to Kercher, Janet C., a part interest. Combination multiple ply manifold business form and airline ticket jacket. 4,624,481, Cl. 282-11.50A.

Kercher, Janet C.: *See*—
Kercher, David M., 4,624,481, Cl. 282-11.50A.

Kern, Hans: *See*—
Arens, Hans; Kern, Hans; and Haslberger, Richard, 4,624,279, Cl. 137-218.000.

Kern, Otto; and Wilhelm, Franz, to Boehringer Ingelheim Vetmedica GmbH. Sedative having analgesic and bradycardiac properties. 4,624,960, Cl. 514-401.000.

Kessler, H. Fred: *See*—
Query, Grady W.; Query, O. Grady; and Kessler, H. Fred, 4,624,070, Cl. 43-132.100.

Keszler, Jozsef: *See*—
Hevesi, Jeno ; Gyapai, Janos; Szudy, Gabor; Nagy, Balint; Vago, Arpad; Geszteiyi, Adamne N.; and Keszler, Jozsef, 4,624,419, Cl. 241-101.00B.

Kieffer, Joseph W.; and Cyphers, Norman A., to Wagner Spray Tech Corporation. Parking lot line striper. 4,624,602, Cl. 404-94.000.

Kiely, Willian L.; and Pedersen, Kristen L., to Sofec, Inc. Rapid deployment mooring and discharge system and method. 4,624,645, Cl. 441-4.000.

Kikuchi, Tatsuji: *See*—
Miyauchi, Terukatsu; Ikeda, Yoneichi; Nakagawa, Takao; Tsutsui, Toshio; and Kikuchi, Tatsuji, 4,624,807, Cl. 264-12.000.

Kikuno, Masayuki: *See*—
Takahara, Shoichiro; and Kikuno, Masayuki, 4,624,530, Cl. 350-336.000.

Killian, Edmund: *See*—
Gabriel, Edmond; and Killian, Edmund, 4,624,598, Cl. 403-24.000.

Kim, Chang J.; and Fiato, Rocco A., to Exxon Research and Engineering Company. Multi-stage Fischer-Tropsch process. 4,624,968, Cl. 518-707.000.

Kim, Kap S.; Tisdale, William R. H.; Andrews, Bruce S.; Nash, T. Randolph; Kolodgie, Kathleen J.; and Eiserike, Steven S., to American Satellite Company. All digital IDMA dynamic channel allocated satellite communications system and method. 4,625,308, Cl. 370-104.000.

Kim, Sun H., to Biomeasure, Inc. 2-amino-4-oxo-tricyclicpyrimidines having antiviral activities against herpes simplex virus type II infections. 4,625,026, Cl. 544-249.000.

Kiminkinen, Kauko E., to Outokumpu Oy. Device for guiding the sample flow in an analyzer. 4,624,565, Cl. 356-315.000.

Kimura, Itsuo: *See*—
Shibano, Tomishi; Kimura, Itsuo; Nomoto, Hiroaki; and Maruchi, Sachio, 4,624,893, Cl. 428-327.000.

Kimura, Kunio; Takao, Masatoshi; Akahira, Nobuo; and Takenaga, Mutsuo. Optical information recording medium of Te, O and Pd and method for making same. 4,624,914, Cl. 430-495.000.

Kimura, Yoshiharu: *See*—
Inoue, Shigeo; Kimura, Yoshiharu; and Adachi, Shigehito, 4,624,920, Cl. 435-142.000.

Kin, Lai, to Windmere Corporation. Hair curling system. 4,624,271, Cl. 132-39.000.

King, Gary: *See*—
Jirkovsky, Ivo; King, Gary; Baudy, Reinhardt; and DeNoble, Victor, 4,624,954, Cl. 514-290.000.

King Jim Co., Ltd.: *See*—
Ohminato, Kiyoshi, 4,624,595, Cl. 402-34.000.

King, John D. Diving plane. 4,624,207, Cl. 114-315.000.

King, Michael J., to 501 Oliver Rubber Company. Tire envelope sealing apparatus for recapping tires. 4,624,732, Cl. 156-394.100.

King, Peter C.; and Arthur, James C. Portable mirror device for rear view observation in a motor vehicle. 4,624,539, Cl. 350-632.000.

Kinley, Karl S., to J. C. Kinley Company. Explosive perforating tool. 4,624,307, Cl. 166-55.300.

Kinney, Frank D.: *See*—
Port, David J.; Houck, David L.; and Kinney, Frank D., 4,624,700, Cl. 75-0.5BB.

Kinstler, John R.: *See*—
Hinks, William L.; and Kinstler, John R., 4,625,101, Cl. 235-462.000.

Kioritz Corporation: *See*—
Kamata, Yoshikiyo, 4,624,156, Cl. 74-595.000.

Kipke, Winfried, to Max Frost KG Maschinen-und Apparatebau. Brush assembly for electrical machine. 4,625,136, Cl. 310-239.000.

Kishimoto, Mikio, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,624,894, Cl. 428-328.000.

Kitagawa, Masatoshi: *See*—
Ishihara, Shinichiro; Hirao, Takashi; Mori, Koshiro; Ono, Masaharu; and Kitagawa, Masatoshi, 4,624,045, Cl. 29-572.000.

Kitamura, Goro; Horiuchi, Hidenori; Aoyama, Masaaki; and Ito, Tokuhisa, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing device in microscope system. 4,625,103, Cl. 250-201.000.

Kitsukawa, Motohiko; and Suzuki, Atsuo, to Hashimoto Forming Industry Co., Ltd. Method of, and apparatus for producing multi-dimensionally bent elongate articles. 4,624,121, Cl. 72-65.000.

Kitzen, Wilhelmus J. W.; and Geelen, Mathias H., to U.S. Philips Corporation. Apparatus for generating a pseudo-stereo signal. 4,625,326, Cl. 381-17.000.

Klak, Roland; and Buchner, Olaf, to Daimler-Benz Aktiengesellschaft. Device for heating the glow plugs of internal combustion engines. 4,624,226, Cl. 123-179.00H.

Klein, Edward P.; and Neider, Thomas M., to Westvaco Corporation. Method of determining black liquor solids concentration remaining in a washed pulp mat. 4,624,742, Cl. 162-49.000.

Klein, Klaus W.: *See*—
Bocker, Jurgen; Gersbach, Klaus; and Klein, Klaus W., 4,624,187, Cl. 102-520.000.

Klubitschko, Gerd; and Stepanek, Premak, to Marker International Company. Step-in yielding heel piece for safety ski binding. 4,624,474, Cl. 280-612.000.

Kluge, Douglas J.: *See*—
Jorgensen, Jorgen A.; Nygren, Donald W.; Kluge, Douglas J.; and Traun, Jerel P., 4,625,087, Cl. 219-10.55F.

Kluger, Edward W.: *See*—
Rekers, John W.; and Kluger, Edward W., 4,624,980, Cl. 524-238.000.

Knabel, Walter; Hafner, Josef; and Scheer, Martin, to Marker International Company. Heel binding. 4,624,473, Cl. 280-612.000.

Kniege, Wilfried: *See*—
Fischer, Wolfgang; and Kniege, Wilfried, 4,625,008, Cl. 526-283.000.

Knipper, Aloysius: *See*—
Vanderveer, Fred; Knipper, Aloysius; Straka, Robert; and Squicciarini, Alex J., 4,624,856, Cl. 426-549.000.

Ko, Duk H. Lid for drinking containers. 4,624,384, Cl. 220-212.000.

Kobayashi, Fumiyuki: *See*—
Watanabe, Yutaka; Kobayashi, Fumiyuki; Ogihara, Satoru; and Ohzawa, Yoshiyuki, 4,624,896, Cl. 428-428.000.

Kobayashi, Hiroo, to Mitsubishi Denki Kabushiki Kaisha. Multicolor complex type cathode-ray tube for use as light source. 4,625,143, Cl. 313-409.000.

Kobayashi, Hiroshi; Sawai, Mikio; Mieda, Junji; and Yoshikubo, Seiichi, to Toto Ltd. Method and apparatus for gasifying and combusting liquid fuel. 4,624,631, Cl. 431-9.000.

Kobayashi, Norihisa: *See*—
Matsuda, Hiro; Nakanishi, Hachiro; Kato, Masao; Orihashi, Yuji; Kobayashi, Norihisa; and Tsuchida, Eishun, 4,624,756, Cl. 204-59.00R.

Kodama, Hisashi; and Ono, Takuro, to Aisin Seiki Kabushiki Kaisha. Hydraulic valve lifter. 4,624,224, Cl. 123-90.460.

Kohno, Akiomi; Hioki, Susumu; Yamada, Toshihiro; Yokoi, Kazuaki; and Yamamoto, Akihiko, to Hitachi, Ltd. Method for bonding ceramics to metals. 4,624,403, Cl. 228-122.000.

Kohno, Hideki: *See*—
Sekihara, Kensuke; Kuroda, Masao; and Kohno, Hideki, 4,625,171, Cl. 324-312.000.
Yamamoto, Etsuji; Matsui, Shigeru; Kuroda, Masuo; and Kohno, Hideki, 4,625,170, Cl. 324-309.000.

Koitabashi, Takatoshi, to Sanden Corporation. Electromagnetic clutch. 4,624,354, Cl. 192-84.00C.

Kojima, Hidetaka: *See*—
Fujiwa, Takaaki; and Kojima, Hidetaka, 4,625,058, Cl. 562-519.000.

Kojima, Ltd.: *See*—
Watanabe, Mitsuo; and Asaba, Takao, 4,624,875, Cl. 428-41.000.

Kojima, Takao: *See*—
Yamada, Tetsusyo; Kojima, Takao; Ishiguro, Hiroyuki; and Nakayama, Yutaka, 4,624,770, Cl. 204-428.000.

Koketsu, Hisakazu; Saga, Toshihiro; Yamada, Toshitaka; Mizuno, Tiaki; and Nakase, Takamichi, to Nippondenso Co., Ltd. Electronic ignition timing adjusting system for internal combustion engines. 4,624,234, Cl. 123-602.000.

Kokubu, Yoshinori; and Chiba, Jiro, to Asahi Glass Company Ltd. Ceramic composition for multilayer printed wiring board. 4,624,934, Cl. 501-17.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,625,172, Cl. 324-326.000.

Kokusho, Yoshitaka; Kato, Shigeaki; and Machida, Haruo, to Meito Sangyo Kabushiki Kaisha. Enzymatic production of phospholipid-saccharide derivatives. 4,624,919, Cl. 435-74.000.

Kolassa, Dieter: *See*—
Keil, Michael; Becker, Rainer; Jahn, Dieter; Kolassa, Dieter; Schirmer, Ulrich; Will, Wolfgang; Wuerzer, Bruno; and Meyer, Norbert, 4,624,696, Cl. 71-88.000.

Kolb, William P.; and Crane, Dale E., to Cyonics, Ltd. Internal mirror laser. 4,625,317, Cl. 372-88.000.

Kolbenschmidt AG: *See*—
Bickle, Wolfgang; Pfoh, Rolf; and Becker, Karl, 4,624,887, Cl. 428-256.000.

Kolodgie, Kathleen J.: *See*—
Kim, Kap S.; Tisdale, William R. H.; Andrews, Bruce S.; Nash, T. Randolph; Kolodgie, Kathleen J.; and Eiserike, Steven S., 4,625,308, Cl. 370-104.000.

Komakine, Shigeo: *See*—
Ochiai, Kuniaki; Horii, Masami; Komakine, Shigeo; and Tsuyuki, Shinzi, 4,624,589, Cl. 400-124.000.

Komatsu, Toshiyuki: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Osada, Yoshiyuki; Omata, Satoshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,625,224, Cl. 357-23.700.

Komatsubara, Tadashi; and Sadamasa, Tetsuo, to Kabushiki Kaisha Toshiba. Double heterostructure light-emitting semiconductor device. 4,625,223, Cl. 357-17.000.

Komiya, Shigeo: *See*—
Izumitani, Tetsuro; Tarumi, Niro; Komiya, Shigeo; and Sawamoto, Takeyuki, 4,625,009, Cl. 526-307.500.

Komiya, Yutaka; Tomosada, Masahiro; Nakamura, Shinichi; Miyata, Masanori; Adachi, Hideki; and Hirose, Masayuki, to Canon Kabushiki Kaisha. Control device. 4,625,156, Cl. 318-85.000.

Kondo, Kazuo: *See*—
Tukazaki, Hisanobu; Kondo, Kazuo; and Matsumoto, Syuzo, 4,625,322, Cl. 377-58.000.

Kondou, Mitsushige: *See*—
Shikama, Shinsuke; Kondou, Mitsushige; Egashira, Nobumasa; and Okada, Kazuo, 4,625,303, Cl. 369-45.000.

Konig, Klaus; Pedain, Josef; and Woynar, Helmut, to Bayer Aktiengesellschaft. Process for the production of polyisocyanates which have a biuret structure. 4,625,052, Cl. 560-335.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Haneda, Satoshi; Itaya, Masahiko; and Tomono, Makoto, 4,624,559, Cl. 355-14.00D.

Konutra Industries, Ltd.: *See*—
Freadman, Tommyca, 4 625,328, Cl. 381-111.000.

Koob, Judith L.: *See*—
Guilbault, Lawrence J.; McEntee, Thomas C.; and Koob, Judith L., 4,624,677, Cl. 8-490.000.

Korb, Louis L.; and Waitkus, Phillip A., to Plastics Engineering Company. Moldable composition suitable for the preparation of vitreous carbon. 4,624,984, Cl. 524-541.000.

Korb, Louis L.: *See*—
Waitkus, Phillip A.; and Korb, Louis L., 4,624,811, Cl. 264-29.500.

Kornaker, Walter, to International Standard Electric Corporation. Color-picture tube with correction magnets in electron gun system for twist correction. 4,625,144, Cl. 313-412.000.

Korth, Bernd, to Protoned B.V. Security clothes-stand. 4,624,371, Cl. 211-4.000.

Kosal, Diane M.; and Maxson, Myron T., to Dow Corning Corporation. Neutralization of alkali metal catalysts in organopolysiloxanes. 4,625,011, Cl. 528-14.000.

Kosswig, Kurt: *See—*
Springmann, Hermann; and Kosswig, Kurt, 4,625,057, Cl. 562-470.000.

Koszyk, Kathleen. Compact portable humidifier. 4,624,806, Cl. 261-91.000.

Kotmans, Hendrik J.: *See—*
Sluijter, Robert J.; and Kotmans, Hendrik J., 4,625,327, Cl. 381-49.000.

Kotoda, Yoshihiro: *See—*
Tomita, Seiji; Morinaga, Kaoru; and Kotoda, Yoshihiro, 4,625,251, Cl. 360-130.210.

Kowal, Steven J., to Stanadyne, Inc. Self-contained lash adjuster with diaphragm-type seal. 4,624,225, Cl. 123-90.580.

Koyama, Masao; Matuo, Syuitu; Nakayama, Chiaki; and Hoshina, Katsumi, to Toshiba Ceramics Co., Ltd. Constituent members of a semiconductor element-manufacturing apparatus and a reaction furnace for making said constituent members. 4,624,735, Cl. 156-610.000.

Koyo Auto-Mech. Co. Ltd.: *See—*
Futaba, Takeshi, 4,624,283, Cl. 137-625.240.

Kozakai, Asao: *See—*
Adachi, Yoshiharu; Kozakai, Asao; Watanabe, Shingo; Nakanishi, Nobuyasu; Oka, Hiroyuki; and Nakagawa, Fumio, 4,624,508, Cl. 303-116.000.

Krabacher, Albert C.; and Eilers, George J., to Eilers, George J. Force-triggered applanation tonometer. 4,624,235, Cl. 128-652.000.

Kraft, Karl-Friedrich; and Merkle, Hans, to Daimler-Benz Aktiengesellschaft. Drive unit for motor vehicle. 4,624,154, Cl. 74-695.000.

Krambeck, Frederick J.; and Schatz, Klaus W., to Mobil Oil Corporation. Closed reactor FCC system with provisions for surge capacity. 4,624,772, Cl. 208-95.000.

Krasko, Zeya K.: *See—*
Keeffe, William M.; Krasko, Zeya K.; and Karlotski, Robert J., 4,625,141, Cl. 313-25.000.

Krawitz, Marc S. Narrow band, SSB, FM transmitter. 4,625,319, Cl. 375-61.000.

Krechmer, Kenneth R.; Milroy, James C.; Burnett, William R.; and Howell, Thomas A., to Prentice Corporation. Integral pivoting power supply. 4,625,259, Cl. 361-340.000.

Kreitchman, Morton A.; and Arnold, Kurt, to Valcor Engineering Corporation. Inflation valve. 4,624,441, Cl. 251-30.010.

Krepski, Larry R.: *See—*
Katritzky, Alan R.; Cato, Stephen J.; Rasmussen, Jerald K.; Krepski, Larry R.; and Heilmann, Steven M., 4,624,995, Cl. 525-452.000.

Kress Corporation: *See—*
LaBerdia, William L.; Kress, Edward S.; and Thomas, Dennis R., 4,624,618, Cl. 414-420.000.

Kress, Donald W. Method of sizing and implanting breast prosthesis. 4,624,671, Cl. 623-8.000.

Kress, Edward S.: *See—*
LaBerdia, William L.; Kress, Edward S.; and Thomas, Dennis R., 4,624,618, Cl. 414-420.000.

Krestyn, Karl-Heinz: *See—*
Grutzmacher, Bertold; and Krestyn, Karl-Heinz, 4,624,454, Cl. 271-30.100.

Kreth, Julius; Schreiber, Alfons; and Steinko, Willi, to Mike & Kremmel Limited. Kitchen slicer having an adjustable knife. 4,624,166, Cl. 83-699.000.

Kridl, Thomas A.: *See—*
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,624,720, Cl. 156-86.000.

Kristofich, John F. Frame assemblies. 4,624,067, Cl. 40-152.100.

Kriwetz, Gert; and Gartner, Karl, to Bender + Co. Gesellschaft mbH. Device for the elution and metering of a radioactive nuclide. 4,625,118, Cl. 250-432.0PD.

Kroy Inc.: *See—*
Richardson, Michael M.; Tuckner, Ronald F.; and Schaffer, Douglas A., 4,624,590, Cl. 400-134.600.

Kruschik, Klaus: *See—*
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; and Kruschik, Klaus, 4,624,475, Cl. 280-618.000.

Kruse, Hansjorg; and Kuch, Heinz, to Hoechst Aktiengesellschaft. Use of oxindole compounds for the treatment of epilepsy. 4,624,963, Cl. 514-418.000.

Ksinsik, Dieter: *See—*
Berndt, Malte; and Ksinsik, Dieter, 4,624,941, Cl. 502-302.000.

Kubota, Yuzuru: *See—*
Okuyama, Toshiaki; and Kubota, Yuzuru, 4,625,272, Cl. 363-81.000.

Kuch, Heinz: *See—*
Kruse, Hansjorg; and Kuch, Heinz, 4,624,963, Cl. 514-418.000.

Kudo, Toshiaki: *See—*
Horikoshi, Koki; Kudo, Toshiaki; and Honda, Hiroshi, 4,624,922, Cl. 435-172.300.

Kudzia, Thomas J.: *See—*
Nix, Richard A.; and Kudzia, Thomas J., 4,624,585, Cl. 384-296.000.

Kuenzel, Ulrich: *See—*
Hinkel, Holger; Kaus, Gerhard; Kuenzel, Ulrich; and Schmid, Gerhard, 4,624,048, Cl. 29-603.000.

Kull, Hermann: *See—*
Grieshaber, Hermann; and Kull, Hermann, 4,624,230, Cl. 123-445.000.

Kumagai, Naotake; Tatemoto, Minoru; Oshima, Shunzou; Maruyama, Mitsunori; Wada, Shunichi; and Shimomura, Setsuhiro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Automobile suspension system. 4,624,477, Cl. 280-707.000.

Kumagai, Naotake: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,624,476, Cl. 280-707.000.

Kumar, Ashok: *See—*
Lee, Gil S.; and Kumar, Ashok, 4,625,127, Cl. 307-270.000.

Kumazawa, Satoru: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.

Kumer, Francis H.; and Leiber, Hans J., to Kummer Freres SA, Fabriques de Machines. Lathe accessory. 4,624,159, Cl. 82-19.000.

Kummer Freres SA, Fabriques de Machines: *See—*
Kumer, Francis H.; and Leiber, Hans J., 4,624,159, Cl. 82-19.006.

Kumoi, Sadakatsu; Mitarai, Keiji; and Tsutsumi, Yukihiro, to Toyo Soda Manufacturing Co., Ltd. Method for producing bis [β(N,N-dimethylamino)ethyl]ether. 4,625,064, Cl. 564-486.000.

Kung, Patrick C.; and Goldstein, Gideon, to Ortho Pharmaceutical Corporation. Hybrid cell line for producing monoclonal antibody to a human early thymocyte antigens, antibody, and methods. 4,624,925, Cl. 435-240.000.

Kunkel, Fred; Hummel, Peter; Cappel, Bert; Schniggenfittig, Gunther; and Kerber, Helmut, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink metering device. 4,624,183, Cl. 101-365.000.

Kuno, Hiroshi: *See—*
Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, 4,624,587, Cl. 400-83.000.

Kunz, Barbara L.: *See—*
Abbey, Kirk J.; Foss, David J.; and Kunz, Barbara L., 4,624,762, Cl. 204-181.700.

Kurahashi, Takashi: *See—*
Ishikawa, Hiroshi; Matsui, Kazuma; Kurahashi, Takashi; Akatsuka, Hidehiko; and Yamada, Motokazu, 4,625,329, Cl. 382-1.000.

Kuraseko, Takao: *See—*
Yamakawa, Kiichiro; Yamamoto, Kenji; Kuraseko, Takao; Nukaga, Tadashi; and Yoshizaki, Koichi, 4,624,118, Cl. 68-12.00R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.
Aoki, Katsumichi; Shida, Takafumi; Kanda, Youichi; Satake, Keigo; Yamazaki, Shiro; and Chida, Tsuneaki, 4,624,698, Cl. 71-90.000.

Kurihara, Takashi; and Nagano, Chikara, to Olympus Optical Co., Ltd. Objective lens system for microscopes. 4,624,535, Cl. 350-414.000.

Kurita, Kazuo; and Ishihara, Hideaki, to Toyo Boseki Kabushiki Kaisha (Toyobo Co., Ltd.). Process for the manufacture of polyamide fibers. 4,624,816, Cl. 264-210.700.

Kuroda, Masao: *See—*
Sekihara, Kensuke; Kuroda, Masao; and Kohno, Hideki, 4,625,171, Cl. 324-312.000.

Kuroda, Masuo: *See—*
Yamamoto, Etsuji; Matsui, Shigeru; Kuroda, Masuo; and Kohno, Hideki, 4,625,170, Cl. 324-309.000.

Kurtz, John G. Toilet flushing apparatus. 4,624,018, Cl. 4-325.000.

Kushida, Naoki: *See—*
Sato, Hiroshi; Kushida, Naoki; and Tanaka, Kazumi, 4,624,891, Cl. 428-321.300.

Kuthi, Csaba: *See—*
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.

Kuwabara, Takao; and Takiguchi, Keitaro, to Hitachi, Ltd. Fail-safe system for a reversible pump-turbine apparatus. 4,624,622, Cl. 415-14.000.

Kuwabara, Takao, to Hitachi, Ltd. Method and apparatus for controlling variable-speed hydraulic power generating system. 4,625,125, Cl. 290-52.000.

Kuwajima, Teruaki; Ishii, Keizou; Miwa, Hiroshi; and Ishikura, Shinichi, to Nippon Paint Co., Ltd. Aqueous coating composition. 4,624,973, Cl. 523-221.000.

Kuwano, Yukinori: *See—*
Haku, Hisao; Goto, Kazuyuki; Tanaka, Masayuki; Fukatsu, Takeo; and Kuwano, Yukinori, 4,624,905, Cl. 430-65.000.

Kwon, Osuk Y., to Lockheed Missiles & Space Company, Inc. Real-time diffraction interferometer. 4,624,569, Cl. 356-354.000.

Kyocera Corporation: *See—*
Kawamura, Takao; Nakayama, Yoshikazu; and Akiyama, Koji, 4,624,906, Cl. 430-84.000.

Kyoto Kikai Kogu Kabushiki Kaisha: *See—*
Ushiro, Masayuki, 4,624,394, Cl. 222-103.000.

Labate, Micheal D. Method and apparatus for pouring molten metal in a neutral atmosphere. 4,624,292, Cl. 141-5.000.

Labbe, Francis A., to Molins PLC. Cigarette manufacture. 4,624,267, Cl. 131-108.000.

LaBerdia, William L.; Kress, Edward S.; and Thomas, Dennis R., to Kress Corporation. Reach back slag pot carrier. 4,624,618, Cl. 414-420.000.

Ladd, Judith A.: *See*—
Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., 4,624,703, Cl. 75-101.00R.

Lade, Robert W.: *See*—
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,624,533, Cl. 350-354.000.

LaFosse, Claude: *See*—
Martin, Jean; and LaFosse, Claude, 4,624,825, Cl. 376-227.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Marhic, Gerard; Schaff, Didier; and Remy, Francis, 4,625,094, Cl. 219-121.0PM.

Lake, Ralph J., Jr.; and Sudol, George A., to Burroughs Corporation. Stable tiltable display terminal. 4,624,434, Cl. 248-454.000.

Lambert, John M.: *See*—
Senter, Peter D.; Lambert, John M.; and Blattler, Walter A., 4,625,014, Cl. 530-300.000.

Lamm, Foster P.; and Pike, Roscoe A., to United Technologies Corporation. Two-component acrylic modified polyester adhesive. 4,624,725, Cl. 156-310.000.

Lancy International, Inc.: *See*—
Kamperman, David R.; Lancy, Leslie E.; and Swank, Claire A., 4,624,790, Cl. 210-665.000.

Lancy, Leslie E.: *See*—
Kamperman, David R.; Lancy, Leslie E.; and Swank, Claire A., 4,624,790, Cl. 210-665.000.

Lando, Jerome B., to Case Western Reserve University. Polymeric material composed of sheets of polydiacetylene and polyacetylene chains. 4,624,761, Cl. 524-80.000.

Landrau, Felix A.: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,624,945, Cl. 514-30.000.

Lane, Philip A.; Schrader, Charles H.; Clausen, Glenn A.; and Self, David E., to Texaco Inc. Fluid catalytic cracking of vacuum residuum oil. 4,624,771, Cl. 208-74.000.

Lang, Helmut V., to BBC Brown, Boveri & Company, Limited. Preseparator for a pipe carrying a two-phase mixture. 4,624,111, Cl. 60-694.000.

Lange, Frederick F., to Rockwell International Corporation. Forming a ceramic by flocculation and centrifugal casting. 4,624,808, Cl. 264-23.000.

Lantz, Alpheus D., to Lantz Construction Company. Cement mobile mixer. 4,624,575, Cl. 366-16.000.

Lantz Construction Company: *See*—
Lantz, Alpheus D., 4,624,575, Cl. 366-16.000.

Lapeyre, Didier: *See*—
Berger, Henri; and Lapeyre, Didier, 4,624,262, Cl. 128-689.000.

Larrick, James W.; Raubitschek, Andrew R.; and Truitt, Kenneth E., to Cetus Corporation. Human lymphoblastold cell line and hybridomas derived therefrom. 4,624,921, Cl. 435-172.200.

Larson, Chad R.: *See*—
Biffle, Lewis L.; and Larson, Chad R., 4,625,077, Cl. 379-28.000.

Lathem Time Recorder Co., Inc.: *See*—
Smith, Arthur E., 4,625,100, Cl. 235-458.000.

Lau, Chi-Leung: *See*—
Weiner, Herbert S.; Mills, William L.; Perkins, Charles E.; Lau, Chi-Leung; Mayhew, Jeffrey P.; and Gordon, Samuel Y., 4,625,288, Cl. 364-521.000.

Laundon, Roy D.; Wickens, Anthony J.; and Turner, John H. W. Process for preparing an iron oxide. 4,624,845, Cl. 423-633.000.

Lawhon, James T., to Texas A&M University System, The. Process for recovery of protein from agricultural commodities prior to alcohol production. 4,624,805, Cl. 530-376.000.

Lawman, Dennis J.; and Greenwood, Gary G. Low profile, high rising lifting mechanism. 4,624,448, Cl. 254-122.000.

Lawrence, Alvah A., to Raychem Corporation. Drop-wire closure having insulation-piercing means. 4,624,519, Cl. 339-97.00P.

Lawrence, Gene W.; and Davis, Thomas L., to United States of America, Air Force. Clutter generator for use in radar evaluation. 4,625,209, Cl. 342-169.000.

Lawrence, Manuel; and Gonsalves, Alfred. Universal suspension tool. 4,624,039, Cl. 29-257.000.

Lawrenz, Dennis A.; and Rinkenberg, Ken A., to Leco Corporation. Sampling tube. 4,624,149, Cl. 73-864.520.

Lazar, Lawrence W.; and Wainio, Ronald A., to Cooper Industries, Inc. Circuit recloser with actuator for trip, close and lock out operation. 4,625,189, Cl. 335-10.000.

Lazzarini, Anna M.; Scarponi, Ugo; de Castiglione, Roberto; Ceserani, Roberto; Castello, Renato; Vaghi, Fabrizio; and Toti, Daniela, to Farmitalia Carlo Erba. Ulcer and gastric secretion inhibiting 4,5,6,7-tetrahydrothiazole[5,4-c]pyridine derivatives. 4,624,956, Cl. 514-301.000.

LCC Cice Compagnie Europeenne de Composants: *See*—
Anne, Jean; Roy, Claude; and Fleuret, Daniel, 4,624,037, Cl. 29-25.420.

Le, Da H., to Transamerica Delaval Inc. Catheter flushing systems. 4,624,662, Cl. 604-249.000.

Lea, James M.; and Haggerty, Peter D., to Cascade Designs, Inc. Inflatable mattress and method of making the same. 4,624,877, Cl. 428-71.000.

Lear Fan Corp. (U.S.): *See*—
Cooney, Daniel E.; and Miller, Russell D., 4,624,436, Cl. 248-555.000.

Lear Siegler, Inc.: *See*—
Relis, Matthew J., 4,625,205, Cl. 340-825.660.

Leco Corporation: *See*—
Lawrenz, Dennis A.; and Rinkenberg, Ken A., 4,624,149, Cl. 73-864.520.

Lee, David B. Elevatable stool construction. 4,624,341, Cl. 182-15.000.

Lee, Gil S.; and Kumar, Ashok, to Advanced Micro Devices, Inc. High-fanout clock driver for low level gates. 4,625,127, Cl. 307-270.000.

Lee, Ping I., to Ciba-Geigy Corporation. Active agent containing hydrogel devices wherein the active agent concentration profile contains a sigmoidal concentration gradient for improved constant release, their manufacture and use. 4,624,848, Cl. 424-22.000.

Lee-Rowan Company: *See*—
Bertram, Paul F., 4,624,376, Cl. 211-187.000.

Lefebvre, Michel S., to Memtec Limited. Apparatus including a flow path formed by membrane compression. 4,624,784, Cl. 210-321.100.

Leiber, Hans J.: *See*—
Kumer, Francis H.; and Leiber, Hans J., 4,624,159, Cl. 82-19.000.

Leiber, Heinz, to Robert Bosch GmbH. Hydraulic brake booster. 4,624,108, Cl. 60-550.000.

Leigh-Monstevens, Keith V.: *See*—
Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., 4,624,290, Cl. 141-1.000.
Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., 4,624,291, Cl. 141-1.000.

Le Marchand, Claude: *See*—
Gerard, Jean-Louis; and Le Marchand, Claude, 4,624,344, Cl. 188-73.360.

Lemberger, Richard R.; Schubert, Paul C.; and Tobin, Steven R., to Minnesota Mining and Manufacturing Company. Apparatus and circuitry for stabilizing laser diode output for analog modulation. 4,625,315, Cl. 372-38.000.

Lembke, Herbert, to Mannesmann Rexroth GmbH. Servovalve. 4,624,284, Cl. 137-625.620.

Lenkauskas, Edmundas. Coiled wire prosthesis for complete or partial ossicular reconstruction. 4,624,672, Cl. 623-10.000.

Lenz, Helmut: *See*—
Tanswell, Paul; Baier, Manfred; and Lenz, Helmut, 4,624,930, Cl. 436-500.000.

Les Cables de Lyon: *See*—
Bocher, Jean-Loup, 4,625,187, Cl. 333-237.000.

Lesch, Hans, to Otto Hansel GmbH. Device for continuously feeding (synchronizing) essentially flat articles of the luxury-food or food industry, especially bars or strips of chocolate, to a packaging machine. 4,624,100, Cl. 53-550.000.

Levad, Thomas M.; and Jewell, Lisle A., to Cargill, Inc. Method and apparatus for pack cooling flat stock. 4,624,614, Cl. 414-95.000.

Lever Brothers Company: *See*—
Lloyd, John; and Rennie, George K., 4,624,890, Cl. 428-290.000.

Levites, Harry H. Fluid powered turbine. 4,624,110, Cl. 60-670.000.

Levko, Fred, to Illinois Tool Works Inc. Switch actuator assembly. 4,624,049, Cl. 29-622.000.

Lewis, James E.: *See*—
Hettinger, William P., Jr.; and Lewis, James E., 4,624,773, Cl. 208-120.000.

Li, Choh H.; Chung, David; Hammonds, R. Glenn, Jr.; and Ramasharma, Kristipati, to University of California, The Regents of The. Human seminal alpha-inhibins. 4,624,944, Cl. 514-12.000.

Li, Tak P.: *See*—
Pechar, Henry W.; and Li, Tak P., 4,625,321, Cl. 375-116.000.

Libbey-Owens-Ford Company: *See*—
Ash, Charles E.; Chambers, Scott W.; Jenkins, David R.; and Herliczek, Siegfried H., 4,624,731, Cl. 156-382.000.

Lile, Richard: *See*—
McBride, Jerald; and Lile, Richard, 4,624,653, Cl. 493-127.000.

Lindahl, Thomas G.: *See*—
Gray, Robert R.; and Lindahl, Thomas G., 4,624,635, Cl. 432-58.000.

Lindlar, Ernest E.: *See*—
Marder, Herman L.; and Lindlar, Ernest E., 4,624,366, Cl. 206-620.000.

Linker, Frank V.; and Linker, Frank V., Jr., to American Tech Manufacturing, Inc. Method and apparatus for trimming the leads of electronic components. 4,624,160, Cl. 83-13.000.

Linker, Frank V., Jr.: *See*—
Linker, Frank V.; and Linker, Frank V., Jr., 4,624,160, Cl. 83-13.000.

Linneman, Kent M.: *See*—
Russell, Jackie D.; and Linneman, Kent M., 4,624,615, Cl. 414-97.000.

Lippert, Theodor: *See*—
Voelter, Wolfgang; and Lippert, Theodor, 4,624,804, Cl. 530-366.000.

Lissau, Frederic: *See*—
Berg, Arthur A.; and Lissau, Frederic, 4,624,345, Cl. 188-196.00M.

Lissner, David. Anti-static chair. 4,625,257, Cl. 361-212.000.

Livermore, Frederick C.: *See*—
Borkowicz, Jerzy; Anderson, James E.; and Livermore, Frederick C., 4,625,255, Cl. 361-91.000.

Ljuty, Evgeny M.: *See*—
Maximovich, Georgy G.; Ganysh, Yaroslav V.; Shatinsky, Viktor F.; Ljuty, Evgeny M.; and Tretyak, Ivan J., 4,624,871, Cl. 427-431.000.

Lloyd, Ben A.: *See*—
Mumford, Neal A.; and Lloyd, Ben A., 4,624,885, Cl. 428-222.000.

Lloyd, John; and Rennie, George K., to Lever Brothers Company. Article suitable for wiping surfaces. 4,624,890, Cl. 428-290.000.

Lobsinger, James L.; and Wefel, Jerry D., to Sundstrand Corporation. Rotary electric machine with centrifugal filter. 4,625,133, Cl. 310-56.000.

Lockheed Missiles & Space Company, Inc.: *See*—
Kwon, Osuk Y., 4,624,569, Cl. 356-354.000.

Loegel, Charles, Jr. Process and apparatus for cutting rock. 4,624,326, Cl. 175-67.000.

Loevinger, Richard P. Heated outlet valve for railway tank car. 4,624,189, Cl. 105-451.000.

Loffler, Victor R. Portable multi-hull watercraft kit. 4,624,209, Cl. 114-354.000.

Long, Delmar D., to Dayco Corporation. Elastomer-coated bias reinforcement fabric and method and apparatus for producing same. 4,624,813, Cl. 264-137.000.

Long, Harry F.; Misselhorn, Donald J.; and Tomchany, Michael, to Armstrong World Industries, Inc. Curtain coating apparatus and method of use. 4,624,213, Cl. 118-300.000.

Long, John D.: *See*—
Lowe, Terry L.; and Long, John D., 4,624,322, Cl. 172-620.000.

Long, Robert B.; and Griffel, Jack, to Exxon Research and Engineering Company. Selective removal of coke precursors from hydrocarbon feedstock. 4,624,776, Cl. 208-302.000.

Lopez, Claudio, to Survival Technology, Inc. Split hub assembly for a necked down cartridge tube. 4,624,393, Cl. 222-83.500.

Loral Electro-Optical Systems: *See*—
Gallagher, Lawrence J., 4,624,641, Cl. 434-21.000.

Lorenz, Klaus: *See*—
Balzer, Wolf-Dieter; Lorenz, Klaus; Wolf, Helmut; Trieselt, Wolfgang; Stoeckigt, Dieter; and Hettche, Albert, 4,624,803, Cl. 252-527.000.

Lotito, Lawrence A.; Huxford, Teresa D.; and Donaldson, Ann L. Automated telephone voice service system. 4,625,081, Cl. 379-88.000.

Love, W. Gregory. Motorcycle steering mechanism. 4,624,470, Cl. 280-279.000.

Lovisolo, Pier P.: *See*—
Melloni, Piero; Salvadori, Paolo; and Lovisolo, Pier P., 4,624,949, Cl. 514-222.000.

Lowe, Terry L.; and Long, John D., to Deere & Company. Harrow with link having spike support attitude control. 4,624,322, Cl. 172-620.000.

Lowery, Guy R.; Hilal, Said S.; Carson, Richard F., Jr.; and Pastrick, Danny L., to American Hospital Supply Corp. Endoscope having a reusable eyepiece and a disposable distal section. 4,624,243, Cl. 128-6.000.

LPB Istituto Farmaceutico S.p.A.: *See*—
Scolastico, Carlo; and Braglia, Gabriele, 4,624,946, Cl. 514-77.000.

LTV Aerospace and Defense Company: *See*—
Harper, Jack E., Jr., 4,624,726, Cl. 156-323.000.

Lucas Industries public limited company: *See*—
Bungay, Michael R.; Stevens, John W.; Turner, Richard M.; and Andrews, Richard J., 4,624,135, Cl. 73-119.00A.
Fenne, Ivor, 4,624,231, Cl. 123-450.000.
Phillips, Ronald, 4,624,233, Cl. 123-506.000.

Lueckenotte, Donald L.; and Kaltenbach, Robert P., to Burns & McDonnell Engineering Co., Inc. Method and apparatus for optimizing power consumption in an electrostatic precipitator. 4,624,685, Cl. 55-13.000.

Luevano, Freddie D. Athletic glove with built-in cushioning. 4,624,016, Cl. 2-161.00A.

Luker, Ronald J.: *See*—
Parker, Robert E.; and Luker, Ronald J., 4,625,104, Cl. 250-202.000.

Lunk, Hans E.; and Reed, Donald A., to Raychem Corporation. Melt-shapeable fluoropolymer compositions. 4,624,990, Cl. 525-199.000.

Lutz, Dieter; and Thieler, Wolfgang, to Sachs-Systemtechnik GmbH. Friction disc clutch for a motor vehicle. 4,624,351, Cl. 192-48.500.

Lykes Pasco Packing Co.: *See*—
Baron, Richard D.; Jones, Michael H.; and Kent, David E., 4,624,395, Cl. 222-129.100.

Lynch, Michel A.: *See*—
Pearce, Christopher; Lynch, Michel A.; and Davis, Richard K., 4,625,277, Cl. 364-416.000.

Lyon, Richard K.: *See*—
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,624,840, Cl. 423-235.000.

Lysenko, Zenon; and Bancroft, Eric E., to Dow Chemical Company, The. Electrocatalytic method for producing quinone methides. 4,624,757, Cl. 204-78.000.

Lysenko, Zenon; and Bancroft, Eric E., to Dow Chemical Company, The. Electrocatalytic method for producing dihydroxybenzophenones. 4,624,758, Cl. 204-78.000.

Lysenko, Zenon; and Bancroft, Eric E., to Dow Chemical Company, The. Electrolytic method for producing quinone methides. 4,624,759, Cl. 204-78.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Kunkel, Fred; Hummel, Peter; Cappel, Bert; Schniggenfittig, Gunther; and Kerber, Helmut, 4,624,183, Cl. 101-365.000.

M.S. Sistemi Automatici S.r.l.: *See*—
Salda, Luciano; Pasqui, Daniele; and Mantovani, Gianni, 4,624,571, Cl. 356-406.000.

Ma, John, to Capetronic (BSR) Ltd. Low-cost VCO using lumped elements in microwave band. 4,625,183, Cl. 331-117.00R.

Maboux, Michel; and Paris, Jean, to Salomon, S.A. Alpine ski boot. 4,624,065, Cl. 36-120.000.

Macaigne, Louis; and Pouchol, Jean-Marie, to Rhone-Poulenc Specialites Chimiques. Novel organopolysiloxane compositions useful as mold release coatings. 4,624,899, Cl. 428-447.000.

MacFarlane, Malcolm J., to Perkin-Elmer Corporation, The. Coma-compensation telescope. 4,624,538, Cl. 350-620.000.

Machida, Haruo: *See*—
Kokusho, Yoshitaka; Kato, Shigeaki; and Machida, Haruo, 4,624,919, Cl. 435-74.000.

MacInnis, Martin B.: *See*—
Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, Michael J., 4,624,844, Cl. 423-593.000.
Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., 4,624,703, Cl. 75-101.00R.

Mack, Robert A.: *See*—
Georgiev, Vassil S.; and Mack, Robert A., 4,625,040, Cl. 549-321.000.

MacKay, Robert K. Adjustable self-leveling sleeve insert for concrete passages. 4,624,086, Cl. 52-220.000.

Mackness, Terry: *See*—
Wezel, Frank V.; and Mackness, Terry, 4,624,061, Cl. 36-30.00A.

Maeda, Hiroshi: *See*—
Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, 4,625,041, Cl. 549-343.000.

Maeda, Kouzo: *See*—
Nagashima, Hideyuki; and Maeda, Kouzo, 4,624,498, Cl. 296-65.00R.

Maeda, Kunihiro: *See*—
Yoshida, Motoko; Itoh, Michio; and Maeda, Kunihiro, 4,624,768, Cl. 204-299.00R.

Maggi, Ezio, to Rockwell-Rimoldi S.p.A. Sewing machine with a base consisting of two detachably connected modules. 4,624,201, Cl. 112-168.000.

Magnetic Peripherals Inc.: *See*—
Dahlgren, Robert P., 4,624,564, Cl. 356-243.000.

Mahaffy & Harder Engineering Co.: *See*—
Harder, John R., 4,624,099, Cl. 53-432.000.

Maida, Osamu: *See*—
Ishizaka, Sunao; and Maida, Osamu, 4,624,540, Cl. 354-21.000.

Maier, Horst, to Telefunken Electronic GmbH. Arrangement for permitting rapid cooling of an electronic component operable at low temperatures. 4,625,229, Cl. 357-81.000.

Majima, Kunio: *See*—
Sakakibara, Yutaka; Ueda, Hidetaka; and Majima, Kunio, 4,625,262, Cl. 362-26.000.

Malagola, Philippe A.; and Vassal, Jean-Marie J., to Framatome & Cie. Process for corrosion protection of a steam generator tube and device for making use of this process. 4,624,750, Cl. 204-26.000.

Malpas, Jon H.; and Calder, Alan R., to Diemoulders Proprietary Limited. Apparatus for dispensing liquids. 4,624,392, Cl. 222-83.000.

Mannerstrom, Leif R., to General Instrument Corporation. Feedforward gain block with mirror image error amplifier. 4,625,178, Cl. 330-149.000.

Mannesmann Aktiengesellschaft: *See*—
Franke, Rudiger; Weiss, Aby; Goergen, Hans; Niemann-Delius, Christian; and Kay, Frank, 4,624,504, Cl. 299-18.000.

Mannesmann Rexroth GmbH: *See*—
Lembke, Herbert, 4,624,284, Cl. 137-625.620.

Manning, George H.; and Riccio, Pasquale R., to Memtec Corporation. Ultra-thin tape cassette transport. 4,625,248, Cl. 360-96.500.

Mansfield Carbon Products: *See*—
Mansfield, Vaughn, 4,624,192, Cl. 110-344.000.

Mansfield, Peter W. Grid system and method for cast forming monolithic concrete roof covering. 4,624,082, Cl. 52-11.000.

Mansfield, Vaughn, to Mansfield Carbon Products. Fluidized bed combuster process. 4,624,192, Cl. 110-344.000.

Mantovani, Gianni: *See*—
Salda, Luciano; Pasqui, Daniele; and Mantovani, Gianni, 4,624,571, Cl. 356-406.000.

Marcel, Frederic E.; and Maume, Francois J. M., to Charbonnages de France. Sound-proofing casing for a pneumatic percussive drill. 4,624,339, Cl. 181-230.000.

Marchant, Derek N., to Flotronics AG. Double-diaphragm pumps. 4,624,628, Cl. 417-393.000.

Marchioni, Bruce C.; and Posey, Dan, to American Hospital Supply Corporation. Process and composition for preventing the discoloration of radiation sterilized cellulosic material exposed to elevated post-sterilization temperatures. 4,624,101, Cl. 53-425.000.

Marder, Herman L.; and Lindlar, Ernest E., to Church & Dwight Co., Inc. Container. 4,624,366, Cl. 206-620.000.

Mardorf, Robert; and von der Haar, Friedrich, to Intermedicat GmbH. Distensible syringe and sensor for injectors. 4,624,658, Cl. 604-121.000.

Mares, Frank; Tang, Reginald Y.; Galle, James E.; and Federici, Rose M., to Allied Corporation. Selective conversion of aliphatic and aromatic aminonitriles and/or dinitriles into lactams. 4,625,023, Cl. 540-539.000.

Margel, Shlomo, to Yeda Research and Development Company Limited. Metal-coated polyaldehyde microspheres. 4,624,923, Cl. 435-176.000.

Marhic, Gerard; Schaff, Didier; and Remy, Francis, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Plasma torches. 4,625,094, Cl. 219-121.0PM.

Markel Industries, Inc.: *See*—
Byrnes, John, 4,624,690, Cl. 55-385.00R.

Marker International Company: *See—*
Klubitschko, Gerd; and Stepanek, Premak, 4,624,474, Cl. 280-612.000.
Knabel, Walter; Hafner, Josef; and Scheer, Martin, 4,624,473, Cl. 280-612.000.

Marotta, Vittorio: *See—*
Valcavi, Umberto; Farina, Paolo; and Marotta, Vittorio, 4,625,021, Cl. 540-230.000.

Marr, Duncan B.: *See—*
Abderhalden, Herbert; Marr, Duncan B.; Heimann, Ivan; and Schmid, Jurg, 4,624,020, Cl. 4-651.000.

Marra, Jerome F.; and Babbitt, William M., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming glass fibers. 4,624,693, Cl. 65-1.000.

Marracino, Nicholas J., to Bertolette Machines, Inc. Straightening machine for motor armature assemblies and the like. 4,624,123, Cl. 72-110.000.

Marrs, C. Denton: *See—*
Rahn, John P.; and Marrs, C. Denton, 4,624,573, Cl. 356-445.000.

Marsh, Gary L. Tank and valve cover with transporting assembly. 4,624,495, Cl. 294-31.200.

Marthaler, Gregory A.; and Marthaler, Robert H. Magazine and directory cover and holder assembly. 4,624,480, Cl. 281-49.000.

Marthaler, Robert H.: *See—*
Marthaler, Gregory A.; and Marthaler, Robert H., 4,624,480, Cl. 281-49.000.

Martin, Dean C., to Whirlpool Corporation. Movable handle structure for control of self-propelled vacuum cleaner. 4,624,027, Cl. 15-340.000.

Martin, Jean; and LaFosse, Claude, to Framatome. Differential movement chain mechanism for controlling a nuclear reactor. 4,624,825, Cl. 376-227.000.

Martin, Roger: *See—*
Andrieux, Bernard; Bourven, Elisabeth; and Martin, Roger, 4,624,686, Cl. 55-196.000.

Martinez, Jean P.: *See—*
Genesio, Rene; Martinez, Jean P.; and Schmitt, Romain, 4,624,637, Cl. 432-239.000.

Maruchi, Sachio: *See—*
Shibano, Tomishi; Kimura, Itsuo; Nomoto, Hiroaki; and Maruchi, Sachio, 4,624,893, Cl. 428-327.000.

Maruyama, Mitsunori: *See—*
Kumagai, Naotake; Tatemoto, Minoru; Oshima, Shunzou; Maruyama, Mitsunori; Wada, Shunichi; and Shimomura, Setsuhiro, 4,624,477, Cl. 280-707.000.
Ohtagaki, Shigeki; Wada, Shunichi; Hata, Yasuaki; Takizawa, Shozo; and Maruyama, Mitsunori, 4,624,478, Cl. 280-707.000.

Masco Corporation: *See—*
Johnson, Dwight N., 4,624,444, Cl. 251-121.000.

Massachusetts General Hospital, The: *See—*
Philip, James H., 4,625,292, Cl. 364-569.000.

Massachusetts Institute of Technology: *See—*
Chryssolouris, George M., 4,625,093, Cl. 219-121.0LJ.
Wurtman, Richard J., 4,624,852, Cl. 514-77.000.

Matekunas, Frederic A., to General Motors Corporation. Engine combustion control with dilution flow by pressure ratio management. 4,624,229, Cl. 123-425.000.

Mathews, Alexander P.: *See—*
Fan, Liang-tseng; and Mathews, Alexander P., 4,624,789, Cl. 210-661.000.

Mathieu, Hans; and Hochstrasser, Jurgen, to Hochstrasser nee Wack, Elisabeth; and Hochstrasser, Jurgen. Turning mechanism operating alternately in opposite directions to facilitate the driving in or extracting of piles. 4,624,324, Cl. 173-93.000.

Mathisson, Goran: *See—*
Hammarskog, Bjorn; Mathisson, Goran; and Santen, Sven, 4,624,059, Cl. 34-20.000.

Matlock, Dyer A.: *See—*
Black, Jimmy C.; Roberts, Bruce E.; and Matlock, Dyer A., 4,624,749, Cl. 204-15.000.

Matsuda, Hiro; Nakanishi, Hachiro; Kato, Masao; Orihashi, Yuji; Kobayashi, Norihisa; and Tsuchida, Eishun, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Method for production of organic electroconductive crystals. 4,624,756, Cl. 204-59.00R.

Matsuda, Tadashi: *See—*
Mizuno, Tsuneo; Takada, Noboru; Shimura, Michio; Satoh, Tohru; and Matsuda, Tadashi, 4,625,221, Cl. 346-140.00R.

Matsui, Kazuma: *See—*
Ishikawa, Hiroshi; Matsui, Kazuma; Kurahashi, Takashi; Akatsuka, Hidehiko; and Yamada, Motokazu, 4,625,329, Cl. 382-1.000.

Matsui, Shigeru: *See—*
Yamamoto, Etsuji; Matsui, Shigeru; Kuroda, Masuo; and Kohno, Hideki, 4,625,170, Cl. 324-309.000.

Matsumoto, Hiroshi: *See—*
Nagano, Eiki; Takemoto, Ichiki; Fukushima, Masayuki; Yoshida, Ryo; and Matsumoto, Hiroshi, 4,624,699, Cl. 71-92.000.

Matsumoto, Mamoru: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,625,032, Cl. 546-81.000.

Matsumoto, Naoaki: *See—*
Ohno, Hiroko; and Matsumoto, Naoaki, 4,624,170, Cl. 84-1.030.
Yuzawa, Keiji; Matsumoto, Naoaki; Kayahara, Takehiko; Tateishi, Naofumi; and Fukuda, Makoto, 4,624,171, Cl. 84-1.030.

Matsumoto, Syuzo: *See—*
Tukazaki, Hisanobu; Kondo, Kazuo; and Matsumoto, Syuzo, 4,625,322, Cl. 377-58.000.

Matsuoka, Hiroshi: *See—*
Ohtsuka, Shuichi; Matsuoka, Hiroshi; and Sato, Yoshimitsu, 4,624,554, Cl. 355-64.000.

Matsuoka, Yuzo: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,625,032, Cl. 546-81.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ishihara, Shinichiro; Hirao, Takashi; Mori, Koshiro; Ono, Masaharu; and Kitagawa, Masatoshi, 4,624,045, Cl. 29-572.000.

Matsushita Electric Works, Ltd.: *See—*
Nakai, Katsumasa, 4,625,152, Cl. 315-317.000.
Oberndorfer, Johannes; Ono, Kenji; and Iwami, Yoshiyuki, 4,625,191, Cl. 335-78.000.

Matsuura, Hiroshi; and Nitta, Tsuneo, to Tokyo Shibaura Denki Kabushiki Kaisha. Monosyllable recognition apparatus. 4,625,287, Cl. 364-513.500.

Matuo, Syuitu: *See—*
Koyama, Masao; Matuo, Syuitu; Nakayama, Chiaki; and Hoshina, Katsumi, 4,624,735, Cl. 156-610.000.

Matuyama, Takeshi: *See—*
Saito, Kimitaka; Iwamoto, Kenzi; Obayashi, Hideki; and Matuyama, Takeshi, 4,624,232, Cl. 123-489.000.

Matuz, Judit: *See—*
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.

Maudgal, Shubha: *See—*
St. Clair, Terry L.; and Maudgal, Shubha, 4,624,888, Cl. 428-262.000.

Maume, Francois J. M.: *See—*
Marcel, Frederic E.; and Maume, Francois J. M., 4,624,339, Cl. 181-230.000.

Maverick Microsystems, Inc.: *See—*
Bivin, Ken L., 4,624,588, Cl. 400-105.000.

Max Frost KG Maschinen-und Apparatebau: *See—*
Kipke, Winfried, 4,625,136, Cl. 310-239.000.

Maximovich, Georgy G.; Ganysh, Yaroslav V.; Shatinsky, Viktor F.; Ljuty, Evgeny M.; and Tretyak, Ivan J., to Fiziko-Mekhanichesky Institut Imeni Karpenko Akademii Nauk Ukrainskoi SSR. Method of producing multicomponent diffusion coatings on metal articles and apparatus for performing same. 4,624,871, Cl. 427-431.000.

Maxson, Myron T.: *See—*
Kosal, Diane M.; and Maxson, Myron T., 4,625,011, Cl. 528-14.000.

Maxwell, Susan M. System for attaching mated pairs of shoes together. 4,624,060, Cl. 36-1.000.

May, Norman W.: *See—*
Zuber, Pierre A.; May, Norman W.; DiSilvestro, Robert J.; and Rhoton, Richard S., 4,625,279, Cl. 364-426.000.

Maybaum, Stephen: *See—*
Moore, John R.; and Maybaum, Stephen, 4,624,898, Cl. 428-446.000.

Mayhew, Jeffrey P.: *See—*
Weiner, Herbert S.; Mills, William L.; Perkins, Charles E.; Lau, Chi-Leung; Mayhew, Jeffrey P.; and Gordon, Samuel Y., 4,625,288, Cl. 364-521.000.

Mazda Motor Corporation: *See—*
Sahara, Masanori; Nishida, Takumi; Sado, Osamu; and Kashimoto, Masaaki, 4,624,228, Cl. 123-378.000.

McBride, Jerald; and Lile, Richard, to R. A. Pearson Co. Corner laminating apparatus and method for cartons. 4,624,653, Cl. 493-127.000.

McCall, Danny, to Examplar. Solar heat transfer and storage system. 4,624,242, Cl. 126-427.000.

McClung, James A.: *See—*
Bulso, Joseph D., Jr.; and McClung, James A., 4,624,125, Cl. 72-453.130.

McCormack, Anthony D.: *See—*
Baker, Richard R.; Dashley, Frederick J.; McCormack, Anthony D.; and Greig, Colin C., 4,624,268, Cl. 131-332.000.

McCorquodale, Alan B. Hot water apparatus. 4,624,219, Cl. 122-170.000.

McDaniel, Robert R.: *See—*
Dawson, Jeffrey C.; McDaniel, Robert R.; and Sedillo, Lawrence P., 4,624,795, Cl. 252-8.553.

McDougal, John R. Process for the manufacture of products from reinforced polyester resins. 4,624,814, Cl. 264-137.000.

McDougall, Glenn. Guitar pickup pole piece. 4,624,172, Cl. 84-1.150.

McElroy, David J., to Texas Instruments Incorporated. Single-ended sense amplifier for dynamic memory array. 4,625,300, Cl. 365-205.000.

McEntee, Thomas C., to Morton Thiokol, Inc. Compositions containing antimicorbial agents in combination with stabilizers. 4,624,679, Cl. 8-650.000.

McEntee, Thomas C.: *See—*
Guilbault, Lawrence J.; McEntee, Thomas C.; and Koob, Judith L., 4,624,677, Cl. 8-490.000.

McGarry, Richard A.; and Noiles, Douglas G., to United States Surgical Corporation. Apparatus for applying surgical clips. 4,624,254, Cl. 128-325.000.

McLeod, Dale K.: *See—*
Garcia, Carlos M.; and McLeod, Dale K., 4,624,052, Cl. 30-97.000.

McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E. Method for electrodeposition of metals. 4,624,753, Cl. 204-58.500.

McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E. Ionic liquid compositions for electrodeposition. 4,624,754, Cl. 204-58.500.

McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E. Preparation of ionic liquids for electrodeposition. 4,624,755, Cl. 204-58.500.

McMullin, Kurt M., to Halliburton Company. Remote cementing plug launching system. 4,624,312, Cl. 166-155.000.

McStravick, David M.; and Chenoweth, David V., to Baker Oil Tools, Inc. Insulating tubular conduit apparatus. 4,624,485, Cl. 285-47.000.

McVicker, Gary B.: *See—*
Fiato, Rocco A.; McVicker, Gary B.; and Montagna, Angelo A., 4,624,967, Cl. 518-700.000.

Meador, Richard A.: *See—*
Wisler, MacMillan M.; Birchak, James R.; and Meador, Richard A., 4,625,173, Cl. 324-351.000.

Measuria, Umakant: *See—*
Cogswell, Frederic N.; and Measuria, Umakant, 4,624,886, Cl. 428-245.000.

Med Marine International Inc.: *See—*
Murtaugh, John J., 4,624,374, Cl. 211-60.100.

Medi-Tech, Incorporated: *See—*
Gould, Arnold S.; and Ciannella, Michael A., 4,624,657, Cl. 604-103.000.

Medical Designs, Inc.: *See—*
Ford, Edward I., 4,624,247, Cl. 128-80.00C.

Medicuba: *See—*
Alvarez Cambras, Rodrigo J., 4,624,249, Cl. 128-92.0ZK.

Mee, William W.: *See—*
Benton, William M.; and Mee, William W., 4,625,276, Cl. 364-408.000.

Mehnert, Gottfried: *See—*
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,624,821, Cl. 264-532.000.

Meier, Kurt: *See—*
Zweifel, Hans; Bauer, Sigrid; and Meier, Kurt, 4,624,912, Cl. 430-258.000.

Meito Sangyo Kabushiki Kaisha: *See—*
Kokusho, Yoshitaka; Kato, Shigeaki; and Machida, Haruo, 4,624,919, Cl. 435-74.000.

Melisz, John M.; and Jellinek, Frank H., to Sybron Corporation. Microscope slide with raised marking surface. 4,624,882, Cl. 428-210.000.

Melloni, Piero; Salvadori, Paolo; and Lovisolo, Pier P., to Farmitalia Carlo Erba, S.p.A. Dibenzo[b,d]thiopyran derivatives, pharmaceutical composition and use. 4,624,949, Cl. 514-222.000.

Memtec Corporation: *See—*
Manning, George H.; and Riccio, Pasquale R., 4,625,248, Cl. 360-96.500.

Memtec Limited: *See—*
Lefebvre, Michel S., 4,624,784, Cl. 210-321.100.

Mengoli, Giovanni: *See—*
Burzi, Giuseppe; Mengoli, Giovanni; and Pogliani, Luciano, 4,625,185, Cl. 333-204.000.

Mensies, Otto: *See—*
Gerritsen, Jan; Barten, Piet G. J.; and Mensies, Otto, 4,625,145, Cl. 313-413.000.

Mercer, M. Ray. Universally testable logic elements and method for structural testing of logic circuits formed of such logic elements. 4,625,310, Cl. 371-15.000.

Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr.; Pietruszkiewicz, Adolph M.; and Woltersdorf, Otto W., Jr., 4,625,047, Cl. 560-53.000.

Merkle, Hans: *See—*
Kraft, Karl-Friedrich; and Merkle, Hans, 4,624,154, Cl. 74-695.000.

Merle, Jean-Pierre, to Enertec. Gripping drive for magnetic tape. 4,624,399, Cl. 226-181.000.

Messier, Kenneth A.; and Rhum, Joseph D., to Pfizer Hospital Products Group, Inc. Caprolactone polymers for suture coating. 4,624,256, Cl. 128-335.500.

Messner, Rudolf. Air diffusion device for aerating water with small bubbles. 4,624,781, Cl. 210-220.000.

Metal Box Enterprises Inc.: *See—*
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,624,821, Cl. 264-532.000.

Methane Drainage Ventures: *See—*
Richards, Walter L., 4,624,328, Cl. 175-78.000.

Metzger, David A.: *See—*
Volk, Michael; Metzger, David A.; Ostby, Donald H.; and Ostby, Robert R., 4,624,689, Cl. 55-269.000.

Meyer, Albertus C.; Tuithof, Hans H.; and Mulder, Jacobus, to U.S. Philips Corporation. Phantom for NMR apparatus. 4,625,168, Cl. 324-300.000.

Meyer, Benjamin S., to United States Medical Corporation. Device system for dental prosthesis fixation to bone. 4,624,673, Cl. 623-16.000.

Meyer, Norbert: *See—*
Keil, Michael; Becker, Rainer; Jahn, Dieter; Kolassa, Dieter; Schirmer, Ulrich; Will, Wolfgang; Wuerzer, Bruno; and Meyer, Norbert, 4,624,696, Cl. 71-88.000.

Miale, Joseph N.: *See—*
Chang, Clarence D.; and Miale, Joseph N., 4,624,774, Cl. 208-120.000.

Michigan State University, Board of Trustees of: *See—*
Schindler, Melvin S.; and Holland, John F., 4,624,915, Cl. 435-4.000.

Micic, Ljubomir; Burth, Rolf D.; Fischer, Thomas; and Schweer, Rainer, to ITT Industries, Inc. Sensor system for television picture tubes. 4,625,153, Cl. 315-370.000.

Mickelson, Roger D.; and Brown, Thomas R., to J. I. Case Company. Pressure-compensating hydraulic system for preventing unauthorized use of a material handling implement. 4,624,106, Cl. 60-452.000.

Mieda, Junji: *See—*
Kobayashi, Hiroshi; Sawai, Mikio; Mieda, Junji; and Yoshikubo, Seiichi, 4,624,631, Cl. 431-9.000.

Mijers, Jan. W. M.; and van der Wal, Gillis P., to Duphar International Research B.V. Automatic injection device. 4,624,660, Cl. 604-136.000.

Mikalonis, Liudas K., to Transmatic, Incorporated. Strip lighting fixture for mass transit vehicles. 4,625,267, Cl. 362-150.000.

Mike & Kremmel Limited: *See—*
Kreth, Julius; Schreiber, Alfons; and Steinko, Willi, 4,624,166, Cl. 83-699.000.

Mike Volk Co., Inc.: *See—*
Volk, Michael; Metzger, David A.; Ostby, Donald H.; and Ostby, Robert R., 4,624,689, Cl. 55-269.000.

Mikiya, Toshio: *See—*
Shiomi, Iwaji; and Mikiya, Toshio, 4,624,608, Cl. 408-56.000.

Milani, Federico; and Binaghi, Marco, to Ausimont S.p.A. Process for grafting unsaturated monomers on olefinic polymers. 4,624,992, Cl. 525-257.000.

Milex Products, Incorporated: *See—*
Stubbs, George, 4,624,258, Cl. 128-341.000.

Miller, Michael J.: *See—*
Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, Michael J., 4,624,844, Cl. 423-593.000.

Miller, Nicholas C., to Riker Laboratories, Inc. Apparatus for administering a nebulized substance. 4,624,251, Cl. 128-200.140.

Miller, Russell D.: *See—*
Cooney, Daniel E.; and Miller, Russell D., 4,624,436, Cl. 248-555.000.

Miller, Theodore H., to Emhart Industries, Inc. Exit device for a door. 4,624,490, Cl. 292-92.000.

Miller, William S., to Alcan International Limited. Aluminum alloy heat treatment. 4,624,717, Cl. 148-12.70A.

Milliken Research Corporation: *See—*
Rekers, John W.; and Kluger, Edward W., 4,624,980, Cl. 524-238.000.
Rogers, Jack S., 4,624,116, Cl. 66-193.000.

Mills, Peter S.; and Daly, Ivor K., to Coal Industry (Patents) Limited. Apparatus for producing aerated cementitious compounds. 4,624,574, Cl. 366-13.000.

Mills, Richard P., to Dow Chemical Company, The. Special purpose scale. 4,624,332, Cl. 177-224.000.

Mills, William L.: *See—*
Weiner, Herbert S.; Mills, William L.; Perkins, Charles E.; Lau, Chi-Leung; Mayhew, Jeffrey P.; and Gordon, Samuel Y., 4,625,288, Cl. 364-521.000.

Milroy, James C.: *See—*
Krechmer, Kenneth R.; Milroy, James C.; Burnett, William R.; and Howell, Thomas A., 4,625,259, Cl. 361-340.000.

Milton Roy Company: *See—*
Holmes, Robert B., 4,625,197, Cl. 340-347.0AD.

Minagawa, Kazumi: *See—*
Takeda, Tohru; and Minagawa, Kazumi, 4,624,409, Cl. 239-11.000.

Minagawa, Shoichi: *See—*
Niitsuma, Teruo; Okamoto, Takeshi; and Minagawa, Shoichi, 4,625,184, Cl. 333-150.000.

Minamoto, Naoki: *See—*
Murayama, Hiromi; and Minamoto, Naoki, 4,624,629, Cl. 417-407.000.

Minezaki, Yutaka: *See—*
Fujigaya, Kazuyuki; Ogawa, Naoki; Shimonosono, Hitoshi; and Minezaki, Yutaka, 4,624,221, Cl. 123-41.080.

Ministry of International Trade and Industry: *See—*
Matsuda, Hiro; Nakanishi, Hachiro; Kato, Masao; Orihashi, Yuji; Kobayashi, Norihisa; and Tsuchida, Eishun, 4,624,756, Cl. 204-59.00R.

Minnesota Mining and Manufacturing: *See—*
Siedle, Allen R.; and Howells, Richard D., 4,625,069, Cl. 568-454.000.

Minnesota Mining and Manufacturing Company: *See—*
Beraudo, Riccardo, 4,625,325, Cl. 378-168.000.
Bries, James L., 4,624,889, Cl. 428-264.000.
Katritzky, Alan R.; Cato, Stephen J.; Rasmussen, Jerald K.; Krepski, Larry R.; and Heilmann, Steven M., 4,624,995, Cl. 525-452.000.
Lemberger, Richard R.; Schubert, Paul C.; and Tobin, Steven R., 4,625,315, Cl. 372-38.000.
Seidel, Udo, 4,624,518, Cl. 339-97.00P.

Minor, Ray C., to New Holland, Inc. Method and apparatus for startup of a hydrostatic transmission. 4,624,333, Cl. 180-6.480.

Minovitch, Michael A. Condensing atmospheric engine and method. 4,624,109, Cl. 60-648.000.

Mintz, Donald J.; and Gleason, Anthony M., to Exxon Research and Engineering Company. Separation of dispersed phase from continuous fluid phase. 4,624,764, Cl. 204-188.000.

Mishra, Umeshwar D.: *See—*
Shideler, Jay A.; and Mishra, Umeshwar D., 4,624,046, Cl. 29-576.00B.

Misselhorn, Donald J.: *See*—
Long, Harry F.; Misselhorn, Donald J.; and Tomchany, Michael, 4,624,213, Cl. 118-300.000.
Mitarai, Keiji: *See*—
Kumoi, Sadakatsu; Mitarai, Keiji; and Tsutsumi, Yukihiro, 4,625,064, Cl. 564-486.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Akira, Shuhara; Kenichiro, Yamanishi; and Yoshibumi, Minowa, 4,624,859, Cl. 427-38.000.
Fukumoto, Takaaki, 4,624,834, Cl. 422-90.000.
Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; Asami, Kazutomo; and Sugihara, Masahiro, 4,624,630, Cl. 418-63.000.
Ikejima, Hiroyuki, 4,625,159, Cl. 318-811.000.
Kawaguchi, Takeo, 4,625,192, Cl. 335-216.000.
Kobayashi, Hiroo, 4,625,143, Cl. 313-409.000.
Kumagai, Naotake; Tatemoto, Minoru; Oshima, Shunzou; Maruyama, Mitsunori; Wada, Shunichi; and Shimomura, Setsuhiro, 4,624,477, Cl. 280-707.000.
Mori, Shunji; and Ito, Masanobu, 4,625,285, Cl. 364-513.000.
Ohtagaki, Shigeki; Wada, Shunichi; Hata, Yasuaki; Takizawa, Shozo; and Maruyama, Mitsunori, 4,624,478, Cl. 280-707.000.
Sakuma, Kiyoshi; Tanimura, Yoshiaki; and Tanaka, Naoki, 4,624,114, Cl. 62-502.000.
Shikama, Shinsuke; Kondou, Mitsushige; Egashira, Nobumasa; and Okada, Kazuo, 4,625,303, Cl. 369-45.000.
Sumi, Tadashi, 4,625,298, Cl. 365-190.000.
Tanahashi, Tooru; and Miyanishi, Yoshio, 4,624,343, Cl. 187-29.00R.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kumagai, Naotake; Tatemoto, Minoru; Oshima, Shunzou; Maruyama, Mitsunori; Wada, Shunichi; and Shimomura, Setsuhiro, 4,624,477, Cl. 280-707.000.
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Ohmae, Takashi; Fukaya, Yasuhiro; and Hirai, Shozo, 4,624,404, Cl. 228-198.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Nagata, Teruyuki; Tamaki, Akihiro; Ohnishi, Hiroki; and Mizuta, Hideki, 4,625,062, Cl. 564-416.000.
Miwa, Hiroshi: *See*—
Kuwajima, Teruaki; Ishii, Keizou; Miwa, Hiroshi; and Ishikura, Shinichi, 4,624,973, Cl. 523-221.000.
Miwa, Yoshiyuki, to Kabushiki Kaisha Toshiba. Rice cooker. 4,625,097, Cl. 219-441.000.
Miyabayashi, Toshio; Sakabe, Nobuyuki; Udagawa, Yoshiyuki; Enyo, Hiroji; and Takemura, Yasuhiko, to Japan Synthetic Rubber Co., Ltd. Multi-component copolymer rubber, a process for producing the same, and a rubber composition containing the multi-component copolymer rubber. 4,625,005, Cl. 526-273.000.
Miyagishima, Toshikazu: *See*—
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,625,032, Cl. 546-81.000.
Miyaguchi, Shoji: *See*—
Okamoto, Tatsuaki; Miyaguchi, Shoji; Shiraishi, Akira; and Kawaoka, Tsukasa, 4,625,076, Cl. 178-22.110.
Miyakawa, Yoshitaka: *See*—
Horiuchi, Makoto; and Miyakawa, Yoshitaka, 4,624,107, Cl. 60-547.100.
Miyanishi, Yoshio: *See*—
Tanahashi, Tooru; and Miyanishi, Yoshio, 4,624,343, Cl. 187-29.00R.
Miyasaka, Nobuaki; Nakamura, Koki; and Yokoyama, Shigeki, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials. 4,624,913, Cl. 430-444.000.
Miyata, Masanori: *See*—
Komiya, Yutaka; Tomosada, Masahiro; Nakamura, Shinichi; Miyata, Masanori; Adachi, Hideki; and Hirose, Masayuki, 4,625,156, Cl. 318-85.000.
Miyauchi, Terukatsu; Ikeda, Yoneichi; Nakagawa, Takao; Tsutsui, Toshio; and Kikuchi, Tatsuji, to Fuji Standard Research Kabushiki Kaisha. Process for producing microspherical, oil-containing carbonaceous particles. 4,624,807, Cl. 264-12.000.
Miyazaki, Takeshi, to Toyoda Gosei Co., Ltd. Hose fixture. 4,624,429, Cl. 248-56.000.
Miyoshi, Makoto: *See*—
Shiraishi, Yasuhiro; and Miyoshi, Makoto, 4,624,335, Cl. 180-142.000.
Mizuno, Tiaki: *See*—
Koketsu, Hisakazu; Saga, Toshihiro; Yamada, Toshitaka; Mizuno, Tiaki; and Nakase, Takamichi, 4,624,234, Cl. 123-602.000.
Mizuno, Tsuneo; Takada, Noboru; Shimura, Michio; Satoh, Tohru; and Matsuda, Tadashi, to Fujitsu Limited. Apparatus for ejecting droplets of ink. 4,625,221, Cl. 346-140.00R.
Mizuta, Hideki: *See*—
Nagata, Teruyuki; Tamaki, Akihiro; Ohnishi, Hiroki; and Mizuta, Hideki, 4,625,062, Cl. 564-416.000.
Mobil Oil Corporation: *See*—
Boyd, Dana M.; and Bustin, Franz, 4,624,654, Cl. 493-194.000.
Chang, Clarence D.; and Miale, Joseph N., 4,624,774, Cl. 208-120.000.
Krambeck, Frederick J.; and Schatz, Klaus W., 4,624,772, Cl. 208-95.000.
Mock, Elmar; and Bron, Alphonse, to ETA S.A., Fabriques d'Ebauches. Wrist watch having a bracelet attached to the watch casing by a hinge. 4,624,581, Cl. 368-282.000.
Modly, Zoltan M., to Harshaw/Filtrol Partnership. Pigment consisting of a mixture of chromium oxide and iron oxide useful in high infra red reflectance gray vinyl composition. 4,624,710, Cl. 106-290.000.
Moeller, Raymond J.: *See*—
Jarzombek, Richard E.; and Moeller, Raymond J., 4,624,983, Cl. 524-474.000.
Mohr, Ralph: *See*—
Yang, Chi C.; Mohr, Ralph; Hudgens, Stephen; Johncock, Annette; and Nath, Prem, 4,624,862, Cl. 427-74.000.
Molins PLC: *See*—
Labbe, Francis A., 4,624,267, Cl. 131-108.000.
Molzahn, Marcelle A.: *See*—
Haluska, Loren A.; and Molzahn, Marcelle A., 4,625,031, Cl. 546-14.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,624,733, Cl. 156-541.000.
Monolithic Memories, Inc.: *See*—
Bosnyak, Robert J., 4,625,162, Cl. 324-51.000.
Fitzpatrick, Mark E.; Tsui, Cyrus Y.; Chan, Andrew K.; and Chan, Albert L., 4,625,311, Cl. 371-15.000.
Monsanto Company: *See*—
Chou, Shine K., 4,624,937, Cl. 502-180.000.
Montagna, Angelo A.: *See*—
Fiato, Rocco A.; McVicker, Gary B.; and Montagna, Angelo A., 4,624,967, Cl. 518-700.000.
Moore, Byron E.: *See*—
Beam, Hoyt W.; Ball, Gregory A.; and Moore, Byron E., 4,624,198, Cl. 112-10.000.
Moore, Harry E. Sight fork for aligning sights on small firearms. 4,624,056, Cl. 33-180.00R.
Moore, John R.; and Maybaum, Stephen, to Harborchem, Inc. Processes for the application of refractory compositions to surfaces such as for the preparation of refractory shell molds and refractory compositions produced thereby. 4,624,898, Cl. 428-446.000.
Moore, Michael L.: *See*—
Callahan, James F.; Moore, Michael L.; and Yim, Nelson C., 4,624,943, Cl. 514-11.000.
Moore and Munger, Inc.: *See*—
Upadhyaya, Janardan D., 4,624,993, Cl. 525-388.000.
Moore, Roger F. Environmental building block container system. 4,624,383, Cl. 220-23.400.
Morbitzer, Hans P.: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; and Kruschik, Klaus, 4,624,475, Cl. 280-618.000.
Morehouse Industries, Inc.: *See*—
Szkaradek, Edward J., 4,624,418, Cl. 241-46.170.
Morganson, Stephen A.; and Schneeman, Erin P., to Economics Laboratory, Inc. Solid rinse aids and methods of warewashing utilizing solid rinse aids. 4,624,713, Cl. 134-25.200.
Mori, Koshiro: *See*—
Ishihara, Shinichiro; Hirao, Takashi; Mori, Koshiro; Ono, Masaharu; and Kitagawa, Masatoshi, 4,624,045, Cl. 29-572.000.
Mori, Shunji; and Ito, Masanobu, to Mitsubishi Denki Kabushiki Kaisha. Robot controller with parallel processing of plural weighted position data which is combined at output to form a single command. 4,625,285, Cl. 364-513.000.
Morimoto, Tadashi: *See*—
Nakanishi, Wataru; and Morimoto, Tadashi, 4,624,606, Cl. 405-269.000.
Morin, Louis G.; and Hoebel, Robert E., to American Cyanamid Company. Process for fiber plating and apparatus with special tensioning mechanism. 4,624,751, Cl. 204-28.000.
Morinaga, Kaoru: *See*—
Tomita, Seiji; Morinaga, Kaoru; and Kotoda, Yoshihiro, 4,625,251, Cl. 360-130.210.
Mortoly, John L., to James L. Taylor Mfg. Co. Equalizer clamp. 4,624,451, Cl. 269-71.000.
Morton Thiokol, Inc.: *See*—
Guilbault, Lawrence J.; McEntee, Thomas C.; and Koob, Judith L., 4,624,677, Cl. 8-490.000.
McEntee, Thomas C., 4,624,679, Cl. 8-650.000.
Mumford, Neal A.; and Lloyd, Ben A., 4,624,885, Cl. 428-222.000.
Mosig, Ernst: *See*—
Bauml, Wolfgang; and Mosig, Ernst, 4,624,218, Cl. 122-136.00R.
Motohashi, Katsuichi: *See*—
Niimura, Isao; Motohashi, Katsuichi; Yamaga, Hiroyoshi; and Akuzawa, Noboru, 4,624,907, Cl. 430-106.000.
Motorola, Inc.: *See*—
Butcher, James S., 4,625,320, Cl. 375-76.000.
Deutsch, Robert W., 4,625,281, Cl. 364-431.030.
Richardson, Julian H.; and Eastmond, Bruce C., 4,625,331, Cl. 455-35.000.
Schroeder, Daniel R., 4,625,274, Cl. 364-200.000.
Moufarrege, Michael N. Process of producing mosaic articles. 4,624,815, Cl. 264-162.000.
Mourray, Jack W., to Ford Motor Company. Piston assembly for shock absorber. 4,624,347, Cl. 188-322.150.
Mourrier, Francis: *See*—
Vannier, Jean; and Mourrier, Francis, 4,624,577, Cl. 366-83.000.
Move-Werk GmbH & Co. KG: *See*—
Irmer, Siegfried, 4,624,675, Cl. 8-115.600.

Mroz, Joseph. Hydraulic clutch and pump assembly. 4,624,355, Cl. 192-85.0AA.
MTC-Choice, Inc.: *See*—
Bandel, David, 4,624,633, Cl. 431-320.000.
Mucha, George M.: *See*—
Pfaffmann, George D.; and Mucha, George M., 4,625,090, Cl. 219-10.570.
Muchnik, Boris J.; and Spong, Fred W., to Storage Technology Corporation. Optical storage structure. 4,625,215, Cl. 346-25.000.
Muchnik, Boris J.: *See*—
Spong, Fred W.; and Muchnik, Boris J., 4,625,217, Cl. 346-76.00L.
Muench, Frank J.; and Borck, Gordon T., to RTE Corporation. Modular under oil expulsion fuse cartridge assembly. 4,625,196, Cl. 337-204.000.
Muenzner, Wulf: *See*—
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,625,252, Cl. 360-130.210.
Mugford, Donald A.: *See*—
Hillebrand, Donald G.; and Mugford, Donald A., 4,624,493, Cl. 293-136.000.
Mulder, Jacobus: *See*—
Meyer, Albertus C.; Tuithof, Hans H.; and Mulder, Jacobus, 4,625,168, Cl. 324-300.000.
Muller, Ernest G., to Colgate-Palmolive Company. Borated polysaccharide absorbents and absorbent products. 4,624,868, Cl. 427-384.000.
Mullin, Robert J.; and O'Sullivan, Donald M. Hip displacement apparatus. 4,624,245, Cl. 128-75.000.
Mumey, Glen A. Herbicide aplicator. 4,624,071, Cl. 47-1.500.
Mumford, Neal A.; and Lloyd, Ben A., to Morton Thiokol, Inc. Low density matrix resins for filament wound chambers comprising chain extended carboxy-terminated polybutadienes. 4,624,885, Cl. 428-222.000.
Munnix, Rene . Building element with internal stud-receiving means. 4,624,647, Cl. 446-120.000.
Murakami, Tsudoi; and Nagahama, Yasuhide, to Kabushiki Kaisha Kobe Seiko Sho. Wrist mechanism for industrial robots and the like. 4,624,621, Cl. 414-735.000.
Murase, Yoshihiko; Nishimura, Seiya; and Tomita, Osamu, to Nippon Gakki Seizo Kabushiki Kaisha. Golf club head. 4,624,460, Cl. 273-167.00H.
Murata, Hiroshi: *See*—
Sasaki, Yutaka; Nakamura, Toshio; Murata, Hiroshi; and Nakamura, Yoshimi, 4,624,800, Cl. 252-313.200.
Murata Manufacturing Co., Ltd.: *See*—
Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, 4,624,935, Cl. 501-134.000.
Murayama, Hiromi; and Minamoto, Naoki, to Aisin Seiki Kabushiki Kaisha. Lubrication mechanism for a turbocharger. 4,624,629, Cl. 417-407.000.
Murdock, James O., III. Sanitizer for bathroom articles. 4,625,119, Cl. 250-455.100.
Murray Corporation: *See*—
Proctor, Robert H., 4,624,112, Cl. 62-149.000.
Murray, Lance R., to Burroughs Corporation. Mask signal generator. 4,625,130, Cl. 307-468.000.
Murtaugh, John J., to Med Marine International Inc. Universal connector. 4,624,374, Cl. 211-60.100.
Muscatell, Ralph P. Fuel dump mechanism for aircraft. 4,624,426, Cl. 244-135.00R.
Muto, Gary. Hydrant coupler valve bracket. 4,624,397, Cl. 224-42.45R.
Myers Industries: *See*—
Ramsey, Roger H., 4,624,509, Cl. 312-234.500.
N.I.T. Co., Ltd.: *See*—
Nakanishi, Wataru; and Morimoto, Tadashi, 4,624,606, Cl. 405-269.000.
Nabisco Brands, Inc.: *See*—
Vanderveer, Fred; Knipper, Aloysius; Straka, Robert; and Squicciarini, Alex J., 4,624,856, Cl. 426-549.000.
Nace, Vaughn M., to Dow Chemical Company, The. Gamma radiation resistant carbonate polymer compositions. 4,624,972, Cl. 523-136.000.
Nagahama, Yasuhide: *See*—
Murakami, Tsudoi; and Nagahama, Yasuhide, 4,624,621, Cl. 414-735.000.
Nagai, Keiichi: *See*—
Simada, Tamotu; Harada, Yoshinori; Kambara, Hideki; Nagai, Keiichi; and Tokita, Jirou, 4,624,769, Cl. 204-301.000.
Nagano, Chikara: *See*—
Kurihara, Takashi; and Nagano, Chikara, 4,624,535, Cl. 350-414.000.
Nagano, Eiki; Takemoto, Ichiki; Fukushima, Masayuki; Yoshida, Ryo; and Matsumoto, Hiroshi, to Sumitomo Chemical Company Limited. 2-substituted phenyl-4,5,6,7-tetrahydro-2H-indazoles, their production, and use as herbicides. 4,624,699, Cl. 71-92.000.
Nagano, Masami, to Hitachi, Ltd. Hot-wire air-flow meter. 4,624,134, Cl. 73-118.200.
Nagasaki, Tatsuo: *See*—
Fujimori, Hiroyoshi; Nagasaki, Tatsuo; Kato, Tadashi; and Sasaki, Masahiko, 4,625,236, Cl. 358-98.000.
Nagashima, Hideyuki; and Maeda, Kouzo, to Nissan Motor Co., Ltd. Seat sliding device of a vehicle. 4,624,498, Cl. 296-65.00R.
Nagashima, Tomoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Headlight device for a vehicle. 4,625,264, Cl. 362-72.000.
Nagashima, Yoshitake, to Canon Kabushiki Kaisha. Monitoring apparatus for liquid jet recording head. 4,625,220, Cl. 346-140.00R.
Nagata, Teruyuki; Tamaki, Akihiro; Ohnishi, Hiroki; and Mizuta, Hideki, to Mitsui Toatsu Chemicals, Inc. Process for producing 4-alkoxyanilines. 4,625,062, Cl. 564-416.000.
Nagle, Dennis C.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,624,766, Cl. 204-294.000.
Nagy, Balint: *See*—
Hevesi, Jeno ; Gyapai, Janos; Szudy, Gabor; Nagy, Balint; Vago, Arpad; Geszteiyi, Adamne N.; and Keszler, Jozsef, 4,624,419, Cl. 241-101.00B.
Nahas, Joseph J.: *See*—
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, 4,625,078, Cl. 379-145.000.
Naito, Kazufumi, to Kabushiki Kaisha Ishida Koki Seisakusho. Weight sensor with vibration error correction. 4,624,331, Cl. 177-185.000.
Nakagawa, Fumio: *See*—
Adachi, Yoshiharu; Kozakai, Asao; Watanabe, Shingo; Nakanishi, Nobuyasu; Oka, Hiroyuki; and Nakagawa, Fumio, 4,624,508, Cl. 303-116.000.
Nakagawa, Jihei, to Sigma Corporation. Four component zoom lens. 4,624,536, Cl. 350-423.000.
Nakagawa, Katsumi; Komatsu, Toshiyuki; Osada, Yoshiyuki; Omata, Satoshi; Hirai, Yutaka; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Thin film transistor having polycrystalline silicon layer with 0.01 to 5 atomic % chlorine. 4,625,224, Cl. 357-23.700.
Nakagawa, Kenji: *See*—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kanazawa, Tomoyoshi; and Nakagawa, Kenji, 4,624,486, Cl. 285-55.000.
Nakagawa, Manabu: *See*—
Hayakawa, Takayuki; Nakagawa, Manabu; Fujii, Hideji; and Sato, Shigeru, 4,625,117, Cl. 250-385.000.
Nakagawa, Takao: *See*—
Miyauchi, Terukatsu; Ikeda, Yoneichi; Nakagawa, Takao; Tsutsui, Toshio; and Kikuchi, Tatsuji, 4,624,807, Cl. 264-12.000.
Nakagawa, Yuzuru, to Onoda Cement Company, Ltd. Flow rate measurement apparatus. 4,624,146, Cl. 73-861.660.
Nakagiri, Takashi: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Osada, Yoshiyuki; Omata, Satoshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,625,224, Cl. 357-23.700.
Nakai, Katsumasa, to Matsushita Electric Works, Ltd. Tricolor fluorescent lamp. 4,625,152, Cl. 315-317.000.
Nakamura, Kenzo: *See*—
Inouye, Masayori; and Nakamura, Kenzo, 4,624,926, Cl. 435-253.000.
Nakamura, Koki: *See*—
Miyasaka, Nobuaki; Nakamura, Koki; and Yokoyama, Shigeki, 4,624,913, Cl. 430-444.000.
Nakamura, Matsuichi, to Daiwa Steel Tube Industries Co., Ltd. Pipe connection method and connecting structure. 4,624,489, Cl. 285-382.000.
Nakamura, Naotaka: *See*—
Yoshida, Ichiro; Atsumi, Morihiro; Yamaguchi, Shunzo; Nakamura, Naotaka; and Yagi, Kenji, 4,625,085, Cl. 200-19.00R.
Nakamura, Shinichi: *See*—
Komiya, Yutaka; Tomosada, Masahiro; Nakamura, Shinichi; Miyata, Masanori; Adachi, Hideki; and Hirose, Masayuki, 4,625,156, Cl. 318-85.000.
Nakamura, Takaharu: *See*—
Itaya, Eiji; Takano, Takeshi; and Nakamura, Takaharu, 4,625,180, Cl. 331-2.000.
Nakamura, Toshio: *See*—
Sasaki, Yutaka; Nakamura, Toshio; Murata, Hiroshi; and Nakamura, Yoshimi, 4,624,800, Cl. 252-313.200.
Nakamura, Yoshimi: *See*—
Sasaki, Yutaka; Nakamura, Toshio; Murata, Hiroshi; and Nakamura, Yoshimi, 4,624,800, Cl. 252-313.200.
Nakanishi, Hachiro: *See*—
Matsuda, Hiro; Nakanishi, Hachiro; Kato, Masao; Orihashi, Yuji; Kobayashi, Norihisa; and Tsuchida, Eishun, 4,624,756, Cl. 204-59.00R.
Nakanishi, Nobuyasu: *See*—
Adachi, Yoshiharu; Kozakai, Asao; Watanabe, Shingo; Nakanishi, Nobuyasu; Oka, Hiroyuki; and Nakagawa, Fumio, 4,624,508, Cl. 303-116.000.
Nakanishi, Wataru; and Morimoto, Tadashi, to N.I.T. Co., Ltd. Foundation improvement process and apparatus thereof. 4,624,606, Cl. 405-269.000.
Nakano, Morio: *See*—
Narushima, Isao; and Nakano, Morio, 4,624,127, Cl. 73-1.0DV.
Nakano, Syozaburo: *See*—
Yasuda, Koichi; Nakano, Syozaburo; and Nishiyama, Noboru, 4,624,406, Cl. 228-263.150.
Nakase, Takamichi: *See*—
Koketsu, Hisakazu; Saga, Toshihiro; Yamada, Toshitaka; Mizuno, Taki; and Nakase, Takamichi, 4,624,234, Cl. 123-602.000.
Nakayama, Chiaki: *See*—
Koyama, Masao; Matuo, Syuitu; Nakayama, Chiaki; and Hoshina, Katsumi, 4,624,735, Cl. 156-610.000.
Nakayama, Hiroshi: *See*—
Hiruma, Masao; Nakayama, Hiroshi; and Suzuki, Michio, 4,624,650, Cl. 464-26.000.

Nakayama, Yoshikazu: *See—*
Kawamura, Takao; Nakayama, Yoshikazu; and Akiyama, Koji, 4,624,906, Cl. 430-84.000.

Nakayama, Yutaka: *See—*
Yamada, Tetsuyo; Kojima, Takao; Ishiguro, Hiroyuki; and Nakayama, Yutaka, 4,624,770, Cl. 204-428.000.

Nakayasu, Morihiro; Tomizawa, Takekazu; and Sugiura, Toshiharu, to Kabushiki Kaisha Okawara Seisakusho. Fluidized-bed dryer. 4,624,058, Cl. 34-10.000.

Namias, Charles S.: *See—*
DiNitto, Robert S.; Porcher, Thomas C.; Eng, John W.; Namias, Charles S.; and Hughes, David B., 4,625,203, Cl. 340-750.000.

Namowicz, Julian; and Gengler, John. High-speed cutting apparatus for card sheets. 4,624,161, Cl. 83-47.000.

Narushima, Isao; and Nakano, Morio, to Teitsu Denshi Kenkyusho Co., Ltd. Method and apparatus for measurement of thickness utilizing ultrasonic pulses. 4,624,127, Cl. 73-1.0DV.

Nash, T. Randolph: *See—*
Kim, Kap S.; Tisdale, William R. H.; Andrews, Bruce S.; Nash, T. Randolph; Kolodgie, Kathleen J.; and Eiserike, Steven S., 4,625,308, Cl. 370-104.000.

Nastech Pharmaceutical Co., Inc.: *See—*
Wenig, Jeffrey, 4,624,965, Cl. 514-619.000.

Nath, Prem: *See—*
Yang, Chi C.; Mohr, Ralph; Hudgens, Stephen; Johncock, Annette; and Nath, Prem, 4,624,862, Cl. 427-74.000.

National Distillers and Chemical Corporation: *See—*
Phifer, John E.; Tucker, Charles R.; and Garst, Roger H., 4,624,793, Cl. 252-8.600.

National Gypsum Company: *See—*
Schneller, Joseph W., 4,624,087, Cl. 52-254.000.

National Research Development Corporation: *See—*
Gould, Michael H., 4,624,782, Cl. 210-268.000.

National Research Institute for Metals: *See—*
Takeda, Tohru; and Minagawa, Kazumi, 4,624,409, Cl. 239-11.000.

Naumann, Gerd; and Syrbius, Gerhard, to Hermann Berstorff Maschinenbau GmbH. Continuous method of sterilizing foodstuffs. 4,624,854, Cl. 426-233.000.

NCR Canada Ltd.: *See—*
Brooks, Ralf M.; and Connell, Brian P., 4,625,216, Cl. 346-76.0PH.

NCR Corporation: *See—*
Gross, Jack R., 4,624,359, Cl. 198-366.000.
Higgins, Raymond L., 4,625,330, Cl. 382-27.000.

NEC Corporation: *See—*
Ichimura, Yoshiaki; Kawabe, Natsuki; Hayashi, Haruo; and Uekido, Kouzou, 4,624,525, Cl. 339-177.00R.
Oda, Takashi; and Yamasaki, Koji, 4,625,212, Cl. 343-702.000.
Saotome, Yasushi; Gokan, Hiroshi; Saigo, Kazuhide; Suzuki, Masayoshi; and Ohnishi, Yoshitake, 4,624,909, Cl. 430-192.000.

Nehezvegyipari Kutato Intezet: *See—*
Hevesi, Jeno ; Gyapai, Janos; Szudy, Gabor; Nagy, Balint; Vago, Arpad; Gesztelyi, Adamne N.; and Keszler, Jozsef, 4,624,419, Cl. 241-101.00B.

Nei, Koichi: *See—*
Kawaguchi, Toshiyuki; Nogami, Takashi; and Nei, Koichi, 4,624,801, Cl. 252-500.000.

Neider, Thomas M.: *See—*
Klein, Edward P.; and Neider, Thomas M., 4,624,742, Cl. 162-49.000.

Neiss, Edward S.; Desai, Rohit M.; and Youssefyeh, Raymond D., to USV Pharmaceutical Corp. 1,2-Dihydro; 1,2,3,4-tetrahydro; 5,8 dihydro; and 5,6,7,8-tetrahydroquinoline derivatives. 4,625,034, Cl. 546-152.000.

Nelson, Carl, to Aerochem, Inc. Apparatus for automated cutting of thin films. 4,624,169, Cl. 83-881.000.

Nestel, Siegfried; and Bohm, Manfred, to International Standard Electric Corporation. Device for determining the direction of incident optical radiation. 4,625,108, Cl. 250-227.000.

Neuman, Grover H.: *See—*
Barnes, Johnny G.; Gaudet, James L.; Hurley, Patrick J.; and Neuman, Grover H., 4,624,591, Cl. 400-171.000.

Neumann, Eleanore R.: *See—*
Neumann, Eugene P.; and Neumann, Eleanore R., 4,624,712, Cl. 134-8.000.

Neumann, Eugene P.; and Neumann, Eleanore R. Stovepipe cleaning apparatus arrangement and method. 4,624,712, Cl. 134-8.000.

Nevin, Donald M. Hub for a rotatable tool. 4,624,876, Cl. 428-65.000.

New Holland, Inc.: *See—*
Minor, Ray C., 4,624,333, Cl. 180-6.480.
Strosser, Richard P., 4,624,180, Cl. 100-41.000.

New Jersey Machine Inc.: *See—*
Voltmer, Helmut; and Schwenzer, Alfred F., 4,624,734, Cl. 156-541.000.

Newell, Chester W. Construction method for placing upright pins in a base plate. 4,624,405, Cl. 228-212.000.

Newest, Inc.: *See—*
Gangi, Alfred J., 4,624,417, Cl. 241-17.000.

Newman, Donald J.; and Dunphy, Gerald F., to Ogden Industries Pty. Ltd. Tumbler lock. 4,624,119, Cl. 70-366.000.

Newman, Peter, to General Electric Company, p.l.c., The. Data signal switching systems. 4,625,306, Cl. 370-60.000.

Newnham, Robert E.: *See—*
Giniewicz, Jayne R.; Safari, Ahmad; Newnham, Robert E.; and Cross, Leslie E., 4,624,796, Cl. 252-62.900.

Ng, Howard: *See—*
Crouch, Paul E.; Nahas, Joseph J.; and Ng, Howard, 4,625,078, Cl. 379-145.000.

NGK Spark Plug Co., Ltd.: *See—*
Ito, Masaya, 4,624,897, Cl. 428-432.000.
Yamada, Tetsuyo; Kojima, Takao; Ishiguro, Hiroyuki; and Nakayama, Yutaka, 4,624,770, Cl. 204-428.000.

Nickola, Richard A., to Inland Steel Company. Aluminum coated low-alloy steel foil. 4,624,895, Cl. 428-335.000.

Nicolai Company, The: *See—*
Howland, William A., 4,624,295, Cl. 144-347.000.

Niemann-Delius, Christian: *See—*
Franke, Rudiger; Weiss, Aby; Goergen, Hans; Niemann-Delius, Christian; and Kay, Frank, 4,624,504, Cl. 299-18.000.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Iijima, Masayuki; and Takahashi, Yoshikazu, 4,624,867, Cl. 427-255.600.
Obinata, Hisaharu, 4,624,767, Cl. 204-298.000.

Niimura, Isao; Motohashi, Katsuichi; Yamaga, Hiroyoshi; and Akuzawa, Noboru, to Hodogaya Chemical Co., Ltd. Electrophotographic toner containing metal complex. 4,624,907, Cl. 430-106.000.

Niitsuma, Teruo; Okamoto, Takeshi; and Minagawa, Shoichi, to Clarion Co., Ltd. Surface acoustic wave device with impedance matching network formed thereon. 4,625,184, Cl. 333-150.000.

Nillesen, Antonius H. H. J., to U.S. Phillips Corporation. Demodulation circuit for a digitized chrominance signal having a sampling signal oscillator coupled to a chrominance signal oscillator. 4,625,232, Cl. 358-23.000.

Ninomiya, Ken: *See—*
Suzuki, Keizo; Ninomiya, Ken; Nishimatsu, Shigeru; and Okudaira, Sadayuki, 4,624,214, Cl. 118-719.000.

Nippert Company, The: *See—*
Nippert, Russell A., 4,624,303, Cl. 165-80.200.

Nippert, Russell A., to Nippert Company, The. Heat sink mounting and method of making. 4,624,303, Cl. 165-80.200.

Nippon Air Brake Co., Ltd.: *See—*
Doto, Shigeaki, 4,624,506, Cl. 303-3.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Murase, Yoshihiko; Nishimura, Seiya; and Tomita, Osamu, 4,624,460, Cl. 273-167.00H.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Tsutsumi, Shuji; Yamaguchi, Yoshirou; and Kageyama, Satoru, 4,624,985, Cl. 524-803.000.

Nippon Kogaku K. K.: *See—*
Ikeno, Tomohisa; Katayama, Akira; and Obo, Hidefumi, 4,624,542, Cl. 354-152.000.
Ishizaka, Sunao; and Maida, Osamu, 4,624,540, Cl. 354-21.000.

Nippon Kogaku K.K.: *See—*
Anzai, Satoru; and Okada, Masashi, 4,624,551, Cl. 355-53.000.

Nippon Paint Co., Ltd.: *See—*
Kuwajima, Teruaki; Ishii, Keizou; Miwa, Hiroshi; and Ishikura, Shinichi, 4,624,973, Cl. 523-221.000.

Nippon Petrochemicals Co., Ltd.: *See—*
Amano, Osamu; Kaiya, Atsushi; Tanaka, Takao; Akimura, Hitoshi; Tsujihata, Katsuhiro; and Hirata, Kouji, 4,624,976, Cl. 524-13.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Tsubakimoto, Tsuneo; Shimomura, Tadao; and Irie, Yoshio, 4,625,001, Cl. 526-88.000.

Nippon Soken, Inc.: *See—*
Saito, Kimitaka; Iwamoto, Kenzi; Obayashi, Hideki; and Matuyama, Takeshi, 4,624,232, Cl. 123-489.000.

Nippon Telegraph & Telephone Public Corporation: *See—*
Okamoto, Tatsuaki; Miyaguchi, Shoji; Shiraishi, Akira; and Kawaoka, Tsukasa, 4,625,076, Cl. 178-22.110.
Tomono, Akira, 4,625,137, Cl. 310-317.000.

Nippon Zeon Co., Ltd.: *See—*
Hiramatsu, Teruaki, 4,624,746, Cl. 203-3.000.

Nippondenso Co., Ltd.: *See—*
Harada, Hitoshi; and Ohsera, Yasumi, 4,624,884, Cl. 428-218.000.
Ishikawa, Hiroshi; Matsui, Kazuma; Kurahashi, Takashi; Akatsuka, Hidehiko; an.l Yamada, Motokazu, 4,625,329, Cl. 382-1.000.
Koketsu, Hisakazu; Saga, Toshihiro; Yamada, Toshitaka; Mizuno, Tiaki; and Nakase, Takamichi, 4,624,234, Cl. 123-602.000.

Nippondenso Co., Ltd: *See—*
Yoshida, Ichiro; Atsumi, Morihiro; Yamaguchi, Shunzo; Nakamura, Naotaka; and Yagi, Kenji, 4,625,085, Cl. 200-19.00R.

Niro-Plan AG: *See—*
Abderhalden, Herbert; Marr, Duncan B.; Heimann, Ivan; and Schmid, Jurg, 4,624,020, Cl. 4-651.000.

Nishida, Takumi: *See—*
Sahara, Masanori; Nishida, Takumi; Sado, Osamu; and Kashimoto, Masaaki, 4,624,228, Cl. 123-378.000.

Nishimatsu, Shigeru: *See—*
Suzuki, Keizo; Ninomiya, Ken; Nishimatsu, Shigeru; and Okudaira, Sadayuki, 4,624,214, Cl. 118-719.000.

Nishimura, Sadanori; and Sekine, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic torque converter. 4,624,105, Cl. 60-361.000.

Nishimura, Seiya: *See—*
Murase, Yoshihiko; Nishimura, Seiya; and Tomita, Osamu, 4,624,460, Cl. 273-167.00H.

Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kanazawa, Tomoyoshi; and Nakagawa, Kenji, to Hitachi Zosen Corporation. Structure at resin pipe connections. 4,624,486, Cl. 285-55.000.

Nishioka, Goro: *See*—
Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, 4,624,935, Cl. 501-134.000.
Nishiyama, Noboru: *See*—
Yasuda, Koichi; Nakano, Syozaburo; and Nishiyama, Noboru, 4,624,406, Cl. 228-263.150.
Nissan Chemical Industries Ltd.: *See*—
Fujinawa, Shoji; Hashiba, Isao; Suzuki, Kenji; Tsuchiya, Syuzi; and Takakuwa, Yasuo, 4,625,053, Cl. 562-401.000.
Sasaki, Tadashi; Fujikawa, Yoshihiro; Sakoda, Ryozo; Sakashita, Mitsuaki; and Hibi, Morihide, 4,624,950, Cl. 514-222.000.
Nissan Motor Co., Ltd.: *See*—
Fujigaya, Kazuyuki; Ogawa, Naoki; Shimonosono, Hitoshi; and Minezaki, Yutaka, 4,624,221, Cl. 123-41.080.
Nagashima, Hideyuki; and Maeda, Kouzo, 4,624,498, Cl. 296-65.00R.
Shiraishi, Yasuhiro; and Miyoshi, Makoto, 4,624,335, Cl. 180-142.000.
Suzuki, Koichi, 4,625,284, Cl. 364-509.000.
Nisshindo Company, Ltd.: *See*—
Sagawa, Hisaji, 4,624,580, Cl. 368-134.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Horiuchi, Makoto; and Miyakawa, Yoshitaka, 4,624,107, Cl. 60-547.100.
Nitschke, Werner, to Robert Bosch GmbH. Monitoring circuit with power-up interval safeguard for a microcomputer. 4,625,309, Cl. 371-12.000.
Nitta, Tsuneo: *See*—
Matsuura, Hiroshi; and Nitta, Tsuneo, 4,625,287, Cl. 364-513.500.
Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; Nakamura, Toshio; Murata, Hiroshi; and Nakamura, Yoshimi, 4,624,800, Cl. 252-313.200.
Nitto Kohki Co., Ltd.: *See*—
Shiomi, Iwaji; and Mikiya, Toshio, 4,624,608, Cl. 408-56.000.
Niwa, Toshiaki; and Inada, Yukichi, to Honda Giken Kogyo Kabushiki Kaisha. Sliding roof device for automobiles. 4,624,501, Cl. 296-222.000.
Nix, Richard A.; and Kudzia, Thomas J., to Automotive Products plc. Retainer bushing. 4,624,585, Cl. 384-296.000.
Nix, Richard A.: *See*—
Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., 4,624,290, Cl. 141-1.000.
Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., 4,624,291, Cl. 141-1.000.
Nixon, Brian J., to Quantum Corporation. Optical encoder apparatus and methods. 4,625,109, Cl. 250-231.0SE.
Nixon, Paul E.; Polavarapu, Murty S.; and Stanasolovich, David, to International Business Machines Corporation. Process using dry etchant to avoid mask-and-etch cycle. 4,624,739, Cl. 156-643.000.
NL Industries, Inc.: *See*—
Wisler, MacMillan M.; Birchak, James R.; and Meador, Richard A., 4,625,173, Cl. 324-351.000.
NL Petroleum Products, Limited: *See*—
Barr, John D., 4,624,830, Cl. 419-7.000.
Noel, Robert J.; and Banik, Anthony, to Armco Inc. Method of treating a nickel base alloy. 4,624,716, Cl. 148-12.70N.
Nogami, Takashi: *See*—
Kawaguchi, Toshiyuki; Nogami, Takashi; and Nei, Koichi, 4,624,801, Cl. 252-500.000.
Noiles, Douglas G.: *See*—
McGarry, Richard A.; and Noiles, Douglas G., 4,624,254, Cl. 128-325.000.
Nomoto, Hiroaki: *See*—
Shibano, Tomishi; Kimura, Itsuo; Nomoto, Hiroaki; and Maruchi, Sachio, 4,624,893, Cl. 428-327.000.
Nordica S.p.A.: *See*—
Pozzebon, Adolfo, 4,624,064, Cl. 36-119.000.
Nordquist, Andrew F.: *See*—
Dyer, Paul N.; Nordquist, Andrew F.; and Pierantozzi, Ronald, 4,624,942, Cl. 502-330.000.
Nordstrom, Barbara: *See*—
Nordstrom, John E., 4,624,096, Cl. 53-209.000.
Nordstrom, John E., to Nordstrom, Barbara, a part interest. High speed wrapping machine. 4,624,096, Cl. 53-209.000.
North, Bernard F.: *See*—
Floyd, William C.; and North, Bernard F., 4,625,029, Cl. 544-309.000.
Northern Telecom Limited: *See*—
Borkowicz, Jerzy; Anderson, James E.; and Livermore, Frederick C., 4,625,255, Cl. 361-91.000.
Northland Aluminum Products, Inc.: *See*—
Jorgensen, Jorgen A.; Nygren, Donald W.; Kluge, Douglas J.; and Traun, Jerel P., 4,625,087, Cl. 219-10.55F.
Norton, Rickie E. Pool cleaner swivel apparatus. 4,624,274, Cl. 134-111.000.
Novatome: *See*—
Baudoin, Andre ; and Traiteur, Rene , 4,624,217, Cl. 122-32.000.
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; and Kruschik, Klaus, to TMC Corporation. Release ski binding. 4,624,475, Cl. 280-618.000.
Nowicki, Casimir W., to Owens-Illinois, Inc. Applying labels to blow molded articles. 4,624,722, Cl. 156-156.000.
Nukaga, Tadashi: *See*—
Yamakawa, Kiichiro; Yamamoto, Kenji; Kuraseko, Takao; Nukaga, Tadashi; and Yoshizaki, Koichi, 4,624,118, Cl. 68-12.00R.
NUKEM GmbH: *See*—
Botzem, Werner; and Quillmann, Heinrich, 4,625,122, Cl. 250-506.100.
Nutech, Inc.: *See*—
Pitcairn, David; and Riccardella, Peter, 4,624,402, Cl. 228-119.000.
Nuwayser, Elie S., to Biotek, Inc. Method of transdermal drug delivery. 4,624,665, Cl. 604-307.000.
N.V. Raychem S.A.: *See*—
Van Dijck, Francis; Peeters, Johan; and Vanbeersel, Jozef, 4,624,879, Cl. 428-102.000.
Nygren, Donald W.: *See*—
Jorgensen, Jorgen A.; Nygren, Donald W.; Kluge, Douglas J.; and Traun, Jerel P., 4,625,087, Cl. 219-10.55F.
Nysen, Paul A.: *See*—
Skeie, Halvor; and Nysen, Paul A., 4,625,208, Cl. 342-51.000.
Obayashi, Hideki: *See*—
Saito, Kimitaka; Iwamoto, Kenzi; Obayashi, Hideki; and Matuyama, Takeshi, 4,624,232, Cl. 123-489.000.
Oberndorfer, Johannes; Ono, Kenji; and Iwami, Yoshiyuki, to Matsushita Electric Works, Ltd. Safety electromagnetic relay. 4,625,191, Cl. 335-78.000.
Oberstrass, Detlev, to Barmag Barmer Maschinenfabrik AG. Bearing assembly for yarn false twisting apparatus. 4,624,103, Cl. 57-348.000.
Obinata, Hisaharu, to Nihon Shinku Gijutsu Kabushiki Kaisha. Sputter etching apparatus having a second electrically floating electrode and magnet means. 4,624,767, Cl. 204-298.000.
Obo, Hidefumi: *See*—
Ikeno, Tomohisa; Katayama, Akira; and Obo, Hidefumi, 4,624,542, Cl. 354-152.000.
Occidental Research Corporation: *See*—
Graham, James R.; and Huntington, John G., 4,625,056, Cl. 562-407.000.
Ochiai, Kuniaki; Horii, Masami; Komakine, Shigeo; and Tsuyuki, Shinzi, to Tokyo Electric Co., Ltd. Dot printer head. 4,624,589, Cl. 400-124.000.
Oda, Kiyoshi: *See*—
Ishii, Susumu; and Oda, Kiyoshi, 4,624,032, Cl. 24-429.000.
Oda, Takashi; and Yamasaki, Koji, to NEC Corporation. Double loop antenna for use in connection to a miniature radio receiver. 4,625,212, Cl. 343-702.000.
Oder, Thomas D.: *See*—
Haines, Kenneth M.; Oder, Thomas D.; and Wood, John E., III, 4,624,471, Cl. 280-411.00R.
Odermatt, Robert, to BBC Brown, Boveri & Company, Limited. Sliding journal bearing. 4,624,584, Cl. 384-114.000.
Oehme, William J., to Harris Corporation. Stabilizer leg interlock. 4,624,511, Cl. 312-273.000.
Oehrle, Robert C.: *See*—
Bosacchi, Bruno; and Oehrle, Robert C., 4,625,114, Cl. 250-341.000.
Ogata, Masanitsu: *See*—
Sato, Goro; Ogata, Masamitsu; and Hirai, Toshiharu, 4,624,936, Cl. 502-65.000.
Ogawa, Hiroshi: *See*—
Tokuhara, Mitsuhiro; and Ogawa, Hiroshi, 4,624,555, Cl. 355-71.000.
Ogawa, Naoki: *See*—
Fujigaya, Kazuyuki; Ogawa, Naoki; Shimonosono, Hitoshi; and Minezaki, Yutaka, 4,624,221, Cl. 123-41.080.
Ogden Industries Pty. Ltd.: *See*—
Newman, Donald J.; and Dunphy, Gerald F., 4,624,119, Cl. 70-366.000.
Ogihara, Satoru: *See*—
Watanabe, Yutaka; Kobayashi, Fumiyuki; Ogihara, Satoru; and Ohzawa, Yoshiyuki, 4,624,896, Cl. 428-428.000.
Ohlsson, Lars-Erik; Soderbaum, Ulf; and Borgersen, Kjell, to AB Volvo Penta. Boat propeller drive unit with trim/tilt sensor. 4,624,643, Cl. 440-2.000.
Ohmae, Takashi; Fukaya, Yasuhiro; and Hirai, Shozo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for bonding ceramics and metals. 4,624,404, Cl. 228-198.000.
Ohminato, Kiyoshi, to King Jim Co., Ltd. Ring type binder. 4,624,595, Cl. 402-34.000.
Ohnishi, Hiroki: *See*—
Nagata, Teruyuki; Tamaki, Akihiro; Ohnishi, Hiroki; and Mizuta, Hideki, 4,625,062, Cl. 564-416.000.
Ohnishi, Yoshitake: *See*—
Saotome, Yasushi; Gokan, Hiroshi; Saigo, Kazuhide; Suzuki, Masayoshi; and Ohnishi, Yoshitake, 4,624,909, Cl. 430-192.000.
Ohno, Hiroko; and Matsumoto, Naoaki, to Casio Computer Co., Ltd. Electronic musical instrument with automatic accompaniment function. 4,624,170, Cl. 84-1.030.
Ohsera, Yasumi: *See*—
Harada, Hitoshi; and Ohsera, Yasumi, 4,624,884, Cl. 428-218.000.
Ohtagaki, Shigeki; Wada, Shunichi; Hata, Yasuaki; Takizawa, Shozo; and Maruyama, Mitsunori, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Suspension device for automobile. 4,624,478, Cl. 280-707.000.
Ohtsu, Yasunori: *See*—
Saito, Kengo; Ohtsu, Yasunori; Akahira, Isao; and Inoue, Makoto, 4,625,247, Cl. 360-71.000.
Ohtsuka, Shuichi; Matsuoka, Hiroshi; and Sato, Yoshimitsu, to Fuji Photo Film Co., Ltd. Charging and exposing head for use in electrophotographic apparatus. 4,624,554, Cl. 355-64.000.
Ohzawa, Yoshiyuki: *See*—
Watanabe, Yutaka; Kobayashi, Fumiyuki; Ogihara, Satoru; and Ohzawa, Yoshiyuki, 4,624,896, Cl. 428-428.000.

Ohzeki, Kazuo, to Kabushiki Kaisha Toshiba. Timing control signal generator for teletext signal waveform equalizer. 4,625,241, Cl. 358-147.000.
Oka, Hiroyuki: *See*—
Adachi, Yoshiharu; Kozakai, Asao; Watanabe, Shingo; Nakanishi, Nobuyasu; Oka, Hiroyuki; and Nakagawa, Fumio, 4,624,508, Cl. 303-116.000.
Okabe, Kazuhiko: *See*—
Yokota, Yukinaga; Sawamoto, Yuji; Taniguchi, Hideki; and Okabe, Kazuhiko, 4,625,063, Cl. 564-480.000.
Okada, Kazuo: *See*—
Shikama, Shinsuke; Kondou, Mitsushige; Egashira, Nobumasa; and Okada, Kazuo, 4,625,303, Cl. 369-45.000.
Okada, Masashi: *See*—
Anzai, Satoru; and Okada, Masashi, 4,624,551, Cl. 355-53.000.
Okada, Mituhiko: *See*—
Itoh, Hiroshi; and Okada, Mituhiko, 4,624,153, Cl. 74-689.000.
Okada, Yozo, to Yoshida Kogyo K. K. Method of and apparatus for sorting slide fasteners. 4,624,369, Cl. 209-626.000.
Okamoto, Takeshi: *See*—
Niitsuma, Teruo; Okamoto, Takeshi; and Minagawa, Shoichi, 4,625,184, Cl. 333-150.G00.
Okamoto, Tatsuaki; Miyaguchi, Shoji; Shiraishi, Akira; and Kawaoka, Tsukasa, to Nippon Telegraph & Telephone Public Corporation. Signed document transmission system. 4,625,076, Cl. 178-22.110.
Okaya, Yoshiharu. Equipment for spectral radiology. 4,625,323, Cl. 378-82.000.
Okudaira, Sadayuki: *See*—
Suzuki, Keizo; Ninomiya, Ken; Nishimatsu, Shigeru; and Okudaira, Sadayuki, 4,624,214, Cl. 118-719.000.
Okuyama, Toshiaki; and Kubota, Yuzuru, to Hitachi, Ltd. Converter control apparatus and method. 4,625,272, Cl. 363-81.000.
O'Loughlin, James P., to United States of America, Air Force. High efficiency electron beam gun foil support. 4,625,316, Cl. 372-74.000.
Olson, Donald L.; and Thomsen, Donald L., to Tennant Company. Surface maintenance machine with rotary lip. 4,624,026, Cl. 15-340.000.
Olsson, Mats A. Infrasound generator. 4,624,220, Cl. 122-379.000.
Olympus Optical Co., Ltd.: *See*—
Fujimori, Hiroyoshi; Nagasaki, Tatsuo; Kato, Tadashi; and Sasaki, Masahiko, 4,625,236, Cl. 358-98.000.
Kurihara, Takashi; and Nagano, Chikara, 4,624,535, Cl. 350-414.000.
Omata, Satoshi: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Osada, Yoshiyuki; Omata, Satoshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,625,224, Cl. 357-23.700.
Onan Corporation: *See*—
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Kung, Patrick C.; and Goldstein, Gideon, 4,624,925, Cl. 435-240.000.
Orton, Dale W. Child safety seatbelt securement device. 4,624,033, Cl. 24-633.000.
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Mullin, Robert J.; and O'Sullivan, Donald M., 4,624,245, Cl. 128-75.000.
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Kiminkinen, Kauko E., 4,624,565, Cl. 356-315.000.
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deNeufville, John P.; Rajoria, Dalbir; and Ovshinsky, Stanford R., 4,624,902, Cl. 429-218.000.
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Marra, Jerome F.; and Babbitt, William M., 4,624,693, Cl. 65-1.000.
Owens, David: *See*—
Buck, John S.; and Owens, David, 4,624,562, Cl. 356-73.100.
Owens-Illinois, Inc.: *See*—
Nowicki, Casimir W., 4,624,722, Cl. 156-156.000.
Trendel, Alois F., 4,624,098, Cl. 53-314.000.
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Vatunen, Markku T., 4,624,688, Cl. 55-238.000.
Oy Partek AB: *See*—
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Hegge, Theodorus C. J. M.; and ter Wiel, Jan, 4,624,799, Cl. 252-301.170.
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Weber, Christian A.; and Paige, William P., 4,624,986, Cl. 525-67.000.
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Parekh, Sharad V., to RCA Corporation. Dual gridded reflector structure. 4,625,214, Cl. 343-756.000.
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Park, Sea C. Multiple function camera. 4,624,541, Cl. 354-83.000.

Parker, Robert E.; and Luker, Ronald J., to Westinghouse Canada Inc. Dual scan optical pattern tracer. 4,625,104, Cl. 250-202.000.
Parnaby, John; and Humphries, Christopher A. M. Rheometer. 4,624,132, Cl. 73-55.000.
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Lowery, Guy R.; Hilal, Said S.; Carson, Richard F., Jr.; and Pastrick, Danny L., 4,624,243, Cl. 128-6.000.
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Echols, Ralph H.; Patel, Bhanubhai H.; and Renfroe, James B., Jr., 4,624,310, Cl. 166-106.000.
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Wherry, Joseph L.; and Patel, Ramanlal L., 4,624,223, Cl. 123-90.440.
Pater, Ruth H.: *See—*
Scola, Daniel A.; and Pater, Ruth H., 4,624,727, Cl. 156-331.800.
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Bender, Edward J.; Patrick, E. Vincent; and Franseen, Richard E., 4,625,106, Cl. 250-213.0VT.
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Dick, Scott M.; and Patterson, Edward F., 4,624,567, Cl. 356-335.000.
Paul Forkardt GmbH & Co. KG: *See—*
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Wolcott, Richard A.; Pearce, Roscoe L.; and Pauley, Charles R., 4,624,839, Cl. 423-228.000.
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Fehr, Kurt; Henych, Ivo; and Pavlovsky, Rudolf, 4,624,702, Cl. 75-93.00R.
Payne, William J., to Crown Creative Industries. Pleated material for a lamp shade. 4,625,268, Cl. 362-352.000.
Pearce, Christopher; Lynch, Michel A.; and Davis, Richard K., to Physio-Control Corporation. Blood pressure measuring device having adaptive cuff deflation rate. 4,625,277, Cl. 364-416.000.
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Kiely, Willian L.; and Pedersen, Kristen I., 4,624,645, Cl. 441-4.000.
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Georgiev, Vassil S.; and Mack, Robert A., 4,625,040, Cl. 549-321.000.
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Sasaki, Toshiyuki; and Sekiguchi, Tomozo, 4,624,594, Cl. 401-176.000.
Peppers, Norman A.: *See—*
Young, James R.; and Peppers, Norman A., 4,624,543, Cl. 355-3.00R.
Perach, Asi, to United Technologies Automotive, Inc. Control valve assembly. 4,624,285, Cl. 137-625.650.
Pere, Gerard, to Creusot-Loire. Degasifier. 4,624,687, Cl. 55-206.000.
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MacFarlane, Malcolm J., 4,624,538, Cl. 350-620.000.
Shriver, Joseph S., 4,625,296, Cl. 364-900.000.
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Weiner, Herbert S.; Mills, William L.; Perkins, Charles E.; Lau, Chi-Leung; Mayhew, Jeffrey P.; and Gordon, Samuel Y., 4,625,288, Cl. 364-521.000.
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Robinson, Charles A.; Perry, Steven B.; and Spector, George, 4,624,294, Cl. 144-253.00F.
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DeRossett, Edmund Z.; and Gentzel, Frederick F., 4,624,666, Cl. 604-366.000.
Peterson, James R.: *See—*
Richmond, Scott C.; and Peterson, James R., 4,625,202, Cl. 340-709.000.
Petolino, Joseph A., Jr.: *See—*
Woffinden, Gary A.; and Petolino, Joseph A., Jr., 4,625,273, Cl. 364-200.000.
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Tomczak, Roman M.; Babcock, William W.; and Petsche, Lee E., 4,624,029, Cl. 17-1.00R.
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Pezzoli, Luigi, to Vamatex S.p.A. Mechanism to control the movements of weft insertion members in shuttleless weaving looms. 4,624,288, Cl. 139-449.000.
Pfaffmann, George D.; and Mucha, George M., to Park-Ohio Industries, Inc. Apparatus for inductively heat treating workpiece bore walls. 4,625,090, Cl. 219-10.570.
Pfeifer, William, to Armstrong Store Fixture Corporation. Locking clip for bar bracket. 4,624,431, Cl. 248-215.000.
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Messier, Kenneth A.; and Rhum, Joseph D., 4,624,256, Cl. 128-335.500.
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Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, 4,625,041, Cl. 549-343.000.
Glazer, Edward A., 4,624,958, Cl. 514-341.000.
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Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,625,116, Cl. 250-363.00S.
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Pham, Ha Q., to Dow Chemical Company, The. Process for stabilizing the hydrolyzable chloride content in epoxy resins. 4,624,975, Cl. 523-453.000.
Phifer, John E.; Tucker, Charles R.; and Garst, Roger H., to National Distillers and Chemical Corporation. Fiber finishes. 4,624,793, Cl. 252-8.600.
Philip, James H., to Massachusetts General Hospital, The. Manual entry rate calculator having continuous updating capability. 4,625,292, Cl. 364-569.000.
Phillimore, Horace R. Windshield wiper control. 4,625,157, Cl. 318-443.000.
Phillips, James D.; and Sheets, Robert L., to J. D. Phillips Corporation. Milling machine. 4,624,610, Cl. 409-132.000.
Phillips, Ronald, to Lucas Industries public limited company. Fuel pumping apparatus. 4,624,233, Cl. 123-506.000.
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Pearce, Christopher; Lynch, Michel A.; and Davis, Richard K., 4,625,277, Cl. 364-416.000.
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Piasecki, Frank N., 4,624,599, Cl. 403-178.000.
Piasecki, Frank N., to Piasecki Aircraft Corp. Multi-tubular truss joint and method of joining tube ends. 4,624,599, Cl. 403-178.000.
Pickett, David R. Apparatus for milling sign cutouts and letters from templates. 4,624,609, Cl. 409-96.000.
Pierantozzi, Ronald: *See—*
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Cragoe, Edward J., Jr.; Pietruszkiewicz, Adolph M.; and Woltersdorf, Otto W., Jr., 4,625,047, Cl. 560-53.000.
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Lamm, Foster P.; and Pike, Roscoe A., 4,624,725, Cl. 156-310.000.
Pilao, Milton. Refining disc for wood pulp or the like. 4,624,420, Cl. 241-298.000.
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Beall, George H.; Doman, Robert C.; and Pinckney, Linda R., 4,624,933, Cl. 501-3.000.
Pinkerton Tobacco Company, The: *See—*
Story, Larry D.; and Pittman, Luther B., 4,624,269, Cl. 131-352.000.
Pinson, George T., to Boeing Company, The. On-board flight control drag actuator system. 4,624,424, Cl. 244-3.210.
Pinto, Ross E., to Tru-Cut, Inc. Lawn edger wheel mechanism. 4,624,321, Cl. 172-15.000.
Pioneer Electronic Corp.: *See—*
Kanamaru, Hitoshi; Funabashi, Tadashi; Takahashi, Junji; and Kato, Kyoichi, 4,625,304, Cl. 369-75.200.
Tsukai, Yoshiyuki; and Tachibana, Akihiro, 4,624,526, Cl. 350-3.720.
Pitcairn, David; and Riccardella, Peter, to Nutech, Inc. Method for applying an overlay weld for preventing and controlling stress corrosion cracking. 4,624,402, Cl. 228-119.000.
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., to Raychem Ltd. Dimensionally heat-recoverable article. 4,624,720, Cl. 156-86.000.
Pitney Bowes Inc.: *See—*
Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward C., 4,625,282, Cl. 364-466.000.
Pittman, Luther B.: *See—*
Story, Larry D.; and Pittman, Luther B., 4,624,269, Cl. 131-352.000.
Planke, Tore, to A/S Tomra Systems. Method for contour recognition of totally or partly transparent objects, e.g., bottles. 4,625,107, Cl. 250-223.00B.
Plasma Energy Corporation: *See—*
Camacho, David P.; and Camacho, Salvador L., 4,625,092, Cl. 219-121.0PM.
Plasticos Polyfilm S/A: *See—*
Derdyk, Flavio, 4,624,365, Cl. 206-554.00.
Plastics Engineering Company: *See—*
Korb, Louis L.; and Waitkus, Phillip A., 4,624,984, Cl. 524-541.000.

Waitkus, Phillip A.; and Korb, Louis L., 4,624,811, Cl. 264-29.500.
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Goodfellow, Robert C.; and Carter, Andrew C., 4,625,225, Cl. 357-30.000.
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Burzi, Giuseppe; Mengoli, Giovanni; and Pogliani, Luciano, 4,625,185, Cl. 333-204.000.
Poikela, Timo J. Voice operated switch. 4,625,083, Cl. 379-389.000.
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Smyers, Michael K.; and Kay, Jack R., 4,625,091, Cl. 219-86.240.
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Nixon, Paul E.; Polavarapu, Murty S.; and Stanasolovich, David, 4,624,739, Cl. 156-643.000.
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Ellis, Edward J.; and Ellis, Jeanne Y., 4,625,007, Cl. 526-279.000.
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Poole, Forrest R.; and Hansen, David G., to David Clark Company Incorporated. Transparent pressure garment. 4,624,248, Cl. 128-89.00R.
Porat, Thomas M., to Crathern Engineering Co., Inc. Apparatus for actuating a suction workholder. 4,624,456, Cl. 271-103.000.
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DiNitto, Robert S.; Porcher, Thomas C.; Eng, John W.; Namias, Charles S.; and Hughes, David B., 4,625,203, Cl. 340-750.000.
Port, David J.; Houck, David L.; and Kinney, Frank D., to GTE Products Corporation. Method for controlling the oxygen content in agglomerated molybdenum powders. 4,624,700, Cl. 75-0.5BB.
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Marchioni, Bruce C.; and Posey, Dan, 4,624,101, Cl. 53-425.000.
Pottinger, John S.; Turner, Andrew D.; Bowen, William R.; and Cox, Dennis R., to United Kingdom Atomic Energy Authority. Filter cleaning. 4,624,760, Cl. 204-141.500.
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Macaigne, Louis; and Pouchol, Jean-Marie, 4,624,899, Cl. 428-447.000.
Pozzebon, Adolfo, to Nordica S.p.A. Ski boot, in particular rear entry ski boot with foot instep securing device. 4,624,064, Cl. 36-119.000.
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Krechmer, Kenneth R.; Milroy, James C.; Burnett, William R.; and Howell, Thomas A., 4,625,259, Cl. 361-340.000.
Prince Corporation: *See*—
Flowerday, Carl W., 4,624,499, Cl. 296-97.00H.
Prockop, Darwin J., to University of Medicine and Dentistry of New Jersey. Collagen inhibiting compositions and processes for manufacturing and using same. 4,625,016, Cl. 530-338.000.
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Toogood, Kevin C., 4,624,849, Cl. 424-78.000.
Proctor, Robert H., to Murray Corporation. Automotive air conditioner charging station with over-ride controls. 4,624,112, Cl. 62-149.000.
Promecam Sisson-Lehmann: *See*—
Passa, Rene , 4,624,164, Cl. 83-542.000.
Propsom, George F., to Western Publishing Company, Inc. Game turntable. 4,624,464, Cl. 273-280.000.
Protoned B.V.: *See*—
Korth, Bernd, 4,624,371, Cl. 211-4.000.
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Puntener, Alois, to Ciba-Geigy Corporation. Metal complexes of azo dyes containing a 2-(P-N-aceloacetylaminophenyl) benzothiozole moiety. 4,625,017, Cl. 534-695.000.
Purcell, Billy D., to International Business Machines Corporation. Ribbon cartridge retention. 4,624,592, Cl. 400-208.000.
Purcell, John R., to GA Technologies Inc. Magnet lead assembly. 4,625,193, Cl. 335-216.000.
Putnam, Richard C., to Cessna Aircraft Company, The. Lockout valve. 4,624,445, Cl. 251-63.400.
Pyliotis, Dimitrios, to Heidelberger Druckmaschinen AG. Device for dampening a printing plate. 4,624,182, Cl. 101-147.000.
Pylon Company: *See*—
Golder, Willis E.; Ierardi, Joseph A.; Staples, Robert E.; and Boyle, Michael C., 4,625,164, Cl. 324-158.00F.
Pyromid, Inc.: *See*—
Hait, Paul W., 4,624,238, Cl. 126-9.00R.
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Nixon, Brian J., 4,625,109, Cl. 250-231.0SE.
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Saunders, Gerald A. B.; and Sorbie, Charles, 4,624,250, Cl. 128-92.00H.
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Query, O. Grady: *See*—
Query, Grady W.; Query, O. Grady; and Kessler, H. Fred, 4,624,070, Cl. 43-132.100.
Quick-Steel Engineering Pty Limited: *See*—
Quittner, John P., 4,624,601, Cl. 404-12.000.
Quillmann, Heinrich: *See*—
Botzem, Werner; and Quillmann, Heinrich, 4,625,122, Cl. 250-506.100.
Quittner, John P., to Quick-Steel Engineering Pty Limited. Transferable roadway lane divider. 4,624,601, Cl. 404-12.000.
Qureshi, Humayun, to Allied Corporation. Liquid handling process. 4,624,928, Cl. 436-179.000.
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McBride, Jerald; and Lile, Richard, 4,624,653, Cl. 493-127.000.
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Sherfinski, David A.; and Raasch, William J., 4,624,626, Cl. 417-87.000.
Radek, John R.; and Flowers, Thaddeus S., to Ready Metal Manufacturing Company. Sheet handling machine. 4,624,455, Cl. 271-85.000.
Rahn, John P.; and Marrs, C. Denton. Total optical loss measurement device. 4,624,573, Cl. 356-445.000.
Raines, Charles D.: *See*—
Hanks, James V.; and Raines, Charles D., 4,624,356, Cl. 192-85.0CA.
Rajoria, Dalbir: *See*—
deNeufville, John P.; Rajoria, Dalbir; and Ovshinsky, Stanford R., 4,624,902, Cl. 429-218.000.
Rakoczynski, Randolph W.: *See*—
Wagner, Louis E.; Flannery, Harold F.; and Rakoczynski, Randolph W., 4,624,604, Cl. 405-128.000.
Ramasharma, Kristipati: *See*—
Li, Choh H.; Chung, David; Hammonds, R. Glenn, Jr.; and Ramasharma, Kristipati, 4,624,944, Cl. 514-12.000.
Ramsey, Roger H., to Myers Industries. Storage drawer. 4,624,509, Cl. 312-234.500.
Rand, Roy E., to Imatron, Inc. Electron beam control assembly for a scanning electron beam computed tomography scanner. 4,625,150, Cl. 315-111.310.
Randall, Robert P., to Traco. Locking tilt window sash and lock therefor. 4,624,073, Cl. 49-161.000.
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Katritzky, Alan R.; Cato, Stephen J.; Rasmussen, Jerald K.; Krepski, Larry R.; and Heilmann, Steven M., 4,624,995, Cl. 525-452.000.
Raubitschek, Andrew R.: *See*—
Larrick, James W.; Raubitschek, Andrew R.; and Truitt, Kenneth E., 4,624,921, Cl. 435-172.200.
Raychem Corporation: *See*—
Breesch, Louis; and Berrondo, Antonino, 4,625,073, Cl. 174-72.00R.
Lawrence, Alvah A., 4,624,519, Cl. 339-97.00P.
Lunk, Hans E.; and Reed, Donald A., 4,624,990, Cl. 525-199.000.
Raychem Ltd: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,624,720, Cl. 156-86.000.
Rayer, Peter: *See*—
Widera, Axel; Schiessl, Alois; Hanser, Walter; Rayer, Peter; and Hieke, Klaus, 4,624,186, Cl. 102-336.000.
RCA Corporation: *See*—
Caprari, Fausto, 4,625,120, Cl. 250-492.100.
Cohen, Edward, 4,625,237, Cl. 358-106.000.
Dietz, Wolfgang F. W., 4,625,155, Cl. 315-408.000.
Harwood, Leopold A., 4,625,233, Cl. 358-28.000.
Parekh, Sharad V., 4,625,214, Cl. 343-756.000.
Willis, Donald H., 4,625,154, Cl. 315-371.000.
Ready Metal Manufacturing Company: *See*—
Radek, John R.; and Flowers, Thaddeus S., 4,624,455, Cl. 271-85.000.
Rebjock, Alain; and Rose, Rene , to Flonic. Memory card manufacturing method and cards thus obtained. 4,625,102, Cl. 235-492.000.
Recreational Technologies Inc.: *See*—
Smith, Leonard S., 4,625,175, Cl. 324-430.000.
Redicon Corporation: *See*—
Bulso, Joseph D., Jr.; and McClung, James A., 4,624,125, Cl. 72-453.130.
Reed, Donald A.: *See*—
Lunk, Hans E.; and Reed, Donald A., 4,624,990, Cl. 525-199.000.
Regie Nationale des Usines Renault: *See*—
Yves, Drutel; and Gerard, Joyez, 4,624,179, Cl. 100-4.000.
Reichman, James R., to Flowdril Corporation. Method for combined jet and mechanical drilling. 4,624,327, Cl. 175-67.000.
Reinking, Klaus: *See*—
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,624,981, Cl. 524-326.000.
Rekers, John W.; and Kluger, Edward W., to Milliken Research Corporation. N-t-alkyl-N-sec-alkyl secondary amine compounds. 4,624,980, Cl. 524-238.000.
Reliance Electric Company: *See*—
Johnson, James D.; and Kamp, Terrence A., 4,624,597, Cl. 403-16.000.
Relis, Matthew J., to Lear Siegler, Inc. Remote control system transmitting a control pulse sequence through interlocked electromechanical relays. 4,625,205, Cl. 340-825.660.
Relyveld, Edgar H., to Institut Pasteur. Polymeric product of daunorubicin and glutaraldehyde. 4,625,019, Cl. 536-6.400.
Remy, Francis: *See*—
Marhic, Gerard; Schaff, Didier; and Remy, Francis, 4,625,094, Cl. 219-121.0PM.
Renfroe, James B., Jr.: *See*—
Echols, Ralph H.; Patel, Bhanubhai H.; and Renfroe, James B., Jr., 4,624,310, Cl. 166-106.000.
Rennie, George K.: *See*—
Lloyd, John; and Rennie, George K., 4,624,890, Cl. 428-290.000.
Repin, Boris N. Method of biological purification of waste water. 4,624,788, Cl. 210-607.000.
Repo, Arvo: *See*—
Kallioinen, Jouko O.; Vahasarja, Tauno J.; and Repo, Arvo, 4,624,777, Cl. 209-170.000.

Republic Money Orders, Inc.: *See*—
Smith, Lawrence G., 4,625,275, Cl. 364-401.000.
Research Foundation of State University of New York, The: *See*—
Inouye, Masayori; and Nakamura, Kenzo, 4,624,926, Cl. 435-253.000.
Resource Technology, Inc.: *See*—
Styron, Robert W., 4,624,711, Cl. 106-308.00S.
Revici, Emanuel, to Avram, Elena. Treatment of symptoms of neoplastic diseases. 4,624,851, Cl. 424-128.000.
Reyer, Manfred; and Schmidts, Klaus, to Hoesch Maschinenfabrik Deutschland AG. Portable hot-press for thermowelding marked and/or printed foils of thermoplastic synthetic material. 4,624,730, Cl. 156-358.000.
Reyes, Miquel A.; and Alfonso, Enivaldo. Armature coil forming machine. 4,624,124, Cl. 72-403.000.
Rheinmetall GmbH: *See*—
Bocker, Jurgen; Gersbach, Klaus; and Klein, Klaus W., 4,624,187, Cl. 102-520.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Fau, Alain, 4,624,900, Cl. 428-447.000.
Macaigne, Louis; and Pouchol, Jean-Marie, 4,624,899, Cl. 428-447.000.
Rhoton, Richard S.: *See*—
Zuber, Pierre A.; May, Norman W.; DiSilvestro, Robert J.; and Rhoton, Richard S., 4,625,279, Cl. 364-426.000.
Rhum, Joseph D.: *See*—
Messier, Kenneth A.; and Rhum, Joseph D., 4,624,256, Cl. 128-335.500.
Riccardella, Peter: *See*—
Pitcairn, David; and Riccardella, Peter, 4,624,402, Cl. 228-119.000.
Riccio, Pasquale R.: *See*—
Manning, George H.; and Riccio, Pasquale R., 4,625,248, Cl. 360-96.500.
Richard Hirschmann Radiotechnisches Werk: *See*—
Zierhut, Hermann, 4,625,113, Cl. 250-338.000.
Richards, Walter L., to Methane Drainage Ventures. In-shaft drilling apparatus for recovery of gas from subterranean formations. 4,624,328, Cl. 175-78.000.
Richardson, Julian H.; and Eastmond, Bruce C., to Motorola, Inc. Automatic frequency control system or an SSB receiver. 4,625,331, Cl. 455-35.000.
Richardson, Michael M.; Tuckner, Ronald F.; and Schaffer, Douglas A., to Kroy Inc. Lettering apparatus. 4,624,590, Cl. 400-134.600.
Richert, Janis K.: *See*—
Bassetti, Larry W.; Kantor, Sherwood; and Richert, Janis K., 4,625,222, Cl. 346-160.000.
Richmeier, Thomas L. Hydraulic high lift jack. 4,624,447, Cl. 254-93.00H.
Richmond, Scott C.; and Peterson, James R., to Tektronix, Inc. Apparatus and method for generating multiple cursors in a raster scan display system. 4,625,202, Cl. 340-709.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.
Ricoh Company, Ltd.: *See*—
Watanabe, Tetsuo, 4,625,218, Cl. 346-76.0PH.
Yasuda, Wataru; Sakamoto, Koji; Kaneko, Toshio; and Kanno, Fuchio, 4,624,545, Cl. 355-3.0DD.
Rikagaku Kenkyusho: *See*—
Horikoshi, Koki; Kudo, Toshiaki; and Honda, Hiroshi, 4,624,922, Cl. 435-172.300.
Riker Laboratories, Inc.: *See*—
Miller, Nicholas C., 4,624,251, Cl. 128-200.140.
Rinkenberg, Ken A.: *See*—
Lawrenz, Dennis A.; and Rinkenberg, Ken A., 4,624,149, Cl. 73-864.520.
Ritson, Carl: *See*—
Danby, Hal C.; and Ritson, Carl, 4,624,663, Cl. 604-250.000.
Rizk, Sidky D.; and Hsieh, Harry W. S., to Essex Specialty Products, Inc. Heat curable one package polyurethane resin composition. 4,624,996, Cl. 525-453.000.
Rizk, Sidky D.; and Hsieh, Harry W. S., to Essex Specialty Products, Inc. Moisture curable polyurethane polymers. 4,625,012, Cl. 528-28.000.
Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of carboxylic acids. 4,625,055, Cl. 562-406.000.
Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of acetic acid. 4,625,060, Cl. 562-607.000.
Roba, Giacomo, to Cselt-Centro Studi Laboratori Telecommunicazioni SpA. Apparatus for the continuous production of optical fibres. 4,624,692, Cl. 65-1.000.
Robbins, Richard W., to Gould Inc. Electric fuse having positioning means for arc-quenching core. 4,625,195, Cl. 337-159.000.
Robert Bosch GmbH: *See*—
Grieshaber, Hermann; and Kull, Hermann, 4,624,230, Cl. 123-445.000.
Leiber, Heinz, 4,624,108, Cl. 60-550.000.
Nitschke, Werner, 4,625,309, Cl. 371-12.000.
Roberts, Bruce E.: *See*—
Black, Jimmy C.; Roberts, Bruce E.; and Matlock, Dyer A., 4,624,749, Cl. 204-15.000.
Robertshaw Controls Company: *See*—
Fowler, Daniel L.; and Froeb, John W., 4,625,084, Cl. 200-11.0DA.
Robeson, Lloyd M.; and Harris, James E., to Union Carbide Corporation. Article molded from a blend of a poly(aryl ether ketone) and a poly(aryl ether sulfone). 4,624,997, Cl. 525-471.000.
Robinson, Charles A.; Perry, Steven B.; and Spector, George. Wood thickness attachment. 4,624,294, Cl. 144-253.00F.
Robinson, Michael, to SCM Chemicals Limited. Recovery of chlorine. 4,624,843, Cl. 423-493.000.
Rockwell International Corporation: *See*—
Glass, Howard L., 4,624,901, Cl. 428-469.000.
Hallford, Ben R., 4,625,179, Cl. 330-286.000.
Lange, Frederick F., 4,624,808, Cl. 264-23.000.
Williams, William J., 4,624,348, Cl. 188-330.000.
Rockwell-Rimoldi S.p.A.: *See*—
Alberti, Adriano; and Valle, Mario, 4,624,202, Cl. 112-313.000.
Maggi, Ezio, 4,624,201, Cl. 112-168.000.
Rockwood, Alyn P., to Evans & Sutherland Computer Corp. Computer graphics system of general surface rendering by exhaustive sampling. 4,625,289, Cl. 364-522.000.
Rodriguez, Paul A., to Xerox Corporation. Folding work organizer. 4,624,556, Cl. 355-75.000.
Roe, John A.: *See*—
Yablonski, Robert E.; and Roe, John A., 4,625,240, Cl. 358-143.000.
Rogemont, Jean, to CEFILAC. Pneumatic safety seal joint made of elastomer with internal septum. 4,624,465, Cl. 277-34.000.
Rogers Corporation: *See*—
Frayer, Paul D., 4,624,978, Cl. 524-104.000.
Rogers, Frank S. Lead cable and spray head for arc metal spray apparatus. 4,624,410, Cl. 239-83.000.
Rogers, Jack S., to Milliken Research Corporation. Loop pile warp knit, weft inserted fabric. 4,624,116, Cl. 66-193.000.
Rogic, Milorad M.: *See*—
Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,624,695, Cl. 71-86.000.
Rohman, Hakan A. E.: *See*—
Berggren, Anders; Rohman, Hakan A. E.; and Ostrup, Leif T., 4,624,257, Cl. 128-334.00C.
Rojey, Alexandre, to Institut Francais du Petrole. Heat exchanger with staggered perforated plates. 4,624,305, Cl. 165-165.000.
Rolls-Royce plc: *See*—
Barraclough, David J., 4,624,820, Cl. 264-512.000.
Romaine, John W. Fire blanket. 4,624,320, Cl. 169-50.000.
Roos, Roland: *See*—
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,625,252, Cl. 360-130.210.
Roos, Uwe V.: *See*—
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,624,821, Cl. 264-532.000.
Rose, Albert: *See*—
Delahoy, Alan E.; Ellis, Frank B., Jr.; and Rose, Albert, 4,625,071, Cl. 136-250.000.
Rose, Rene : *See*—
Rebjock, Alain; and Rose, Rene , 4,625,102, Cl. 235-492.000.
Rosen, Bruce R.: *See*—
Wedeen, Van J.; and Rosen, Bruce R., 4,625,169, Cl. 324-309.000.
Rotec Industries, Inc.: *See*—
Oury, Robert F.; and Arndt, Charles J., 4,624,357, Cl. 198-313.000.
Rothenbucher, Robert K., to Smithco Engineering. Lethal service header box. 4,624,379, Cl. 220-4.00R.
Rothstein, Samuel. Tube inspection probe with rotating eddy current coil. 4,625,165, Cl. 324-220.000.
Roy, Claude: *See*—
Anne, Jean; Roy, Claude; and Fleuret, Daniel, 4,624,037, Cl. 29-25.420.
Royal Children's Hospital Research Foundation: *See*—
Albert, Manuel J.; Barnes, Graeme L.; and Bishop, Ruth F., 4,624,850, Cl. 424-89.000.
RPM Industries, Inc.: *See*—
Strongosky, John M.; and Freund, David M., 4,624,375, Cl. 211-170.000.
RTE Corporation: *See*—
Muench, Frank J.; and Borck, Gordon T., 4,625,196, Cl. 337-204.000.
Rudin, Richard E., to S. C. Johnson & Son, Inc. Instant yogurt food product. 4,624,853, Cl. 426-61.000.
Rudolph, Gunter W.; Stercken, Karl; and Forster, Eckehard F. O., to Hamburger Stahlwerke GmbH. Method of cooling strands in the continuous casting of steel. 4,624,298, Cl. 164-486.000.
Russell, Jackie D.; and Linneman, Kent M., to Biltwell Company, Inc., The. Stacker for pants and other sewn garments. 4,624,615, Cl. 414-97.000.
Russell, William M.: *See*—
Barnes, Hugh V.; and Russell, William M., 4,624,632, Cl. 431-77.000.
Rutnarak, Sangvorn, to Abbott Laboratories. Additive transfer device. 4,624,667, Cl. 604-414.000.
S. C. Johnson & Son, Inc.: *See*—
Rudin, Richard E., 4,624,853, Cl. 426-61.000.
S. D. Warren Company: *See*—
Vreeland, Jay H., 4,624,744, Cl. 162-206.000.
Sabo, Alex. Front wheel bearing pusher. 4,624,040, Cl. 29-258.000.
Sachs-Systemtechnik GmbH: *See*—
Lutz, Dieter; and Thieler, Wolfgang, 4,624,351, Cl. 192-48.500.
Sadamasa, Tetsuo: *See*—
Komatsubara, Tadashi; and Sadamasa, Tetsuo, 4,625,223, Cl. 357-17.000.

Sadler, David E.; and Walters, Norman A. Method of using a roll of perforated plastic roofing tabs. 4,624,721, Cl. 156-92.000.

Sado, Osamu: *See—*
Sahara, Masanori; Nishida, Takumi; Sado, Osamu; and Kashimoto, Masaaki, 4,624,228, Cl. 123-378.000.

Safari, Ahmad: *See—*
Giniewicz, Jayne R.; Safari, Ahmad; Newnham, Robert E.; and Cross, Leslie E., 4,624,796, Cl. 252-62.900.

Safrit, Sam C.; Farrell, Roscoe M.; and Euliss, Melvin C., to Kayser-Roth Hosiery, Inc. Seamless blank for body garment and method of forming same. 4,624,115, Cl. 66-172.00R.

Saga, Toshihiro: *See—*
Koketsu, Hisakazu; Saga, Toshihiro; Yamada, Toshitaka; Mizuno, Tiaki; and Nakase, Takamichi, 4,624,234, Cl. 123-602.000.

Sagawa, Hisaji, to Nisshindo Company, Ltd. Twisting pendulum operating apparatus. 4,624,580, Cl. 368-134.000.

Sagi, Zsigmond L., to B.C.S.I. Laboratories, Inc. Method of early detection of breast cancer. 4,624,264, Cl. 128-736.000.

Sagl, Rudolf J. C., to B.E.L-Tronics Limited. Construction for a portable radar detector having a mirror. 4,625,210, Cl. 342-20.000.

Sahara, Masanori; Nishida, Takumi; Sado, Osamu; and Kashimoto, Masaaki, to Mazda Motor Corporation. Intake system for diesel cycle engines. 4,624,228, Cl. 123-378.000.

Saiga, Yutaka: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,625,032, Cl. 546-81.000.

Saigo, Kazuhide: *See—*
Saotome, Yasushi; Gokan, Hiroshi; Saigo, Kazuhide; Suzuki, Masayoshi; and Ohnishi, Yoshitake, 4,624,909, Cl. 430-192.000.

Sailer, Hubert; Ehrlinger, Friedrich J.; and Dietenberger, Josef, to Zahnradfabrik Friedrichshafen AG. Friction device. 4,624,353, Cl. 192-70.120.

St. Clair, Terry L.; and Maudgal, Shubha, to United States of America, National Aeronautics and Space Administration. Acetylene (ethynyl) terminated polyimide siloxane and process for preparation thereof. 4,624,888, Cl. 428-262.000.

Saito, Kengo; Ohtsu, Yasunori; Akahira, Isao; and Inoue, Makoto, to Sony Corporation. Disk drive. 4,625,247, Cl. 360-71.000.

Saito, Kimitaka; Iwamoto, Kenzi; Obayashi, Hideki; and Matuyama, Takeshi, to Nippon Soken, Inc. Apparatus for controlling air-fuel ratio in internal combustion engine. 4,624,232, Cl. 123-489.000.

Saito, Nobuhiro, to Toshiba Silicone Co., Ltd. Ethylidenenorbornyl dimethylmethacryloxysilane. 4,625,043, Cl. 556-442.000.

Saito, Yoshihiro: *See—*
Endo, Makoto; Ono, Satoshi; Toda, Takao; Kashiwagi, Kazuo; Yanagi, Masaaki; and Saito, Yoshihiro, 4,624,547, Cl. 355-14.00E.

Sakabe, Nobuyuki: *See—*
Miyabayashi, Toshio; Sakabe, Nobuyuki; Udagawa, Yoshiyuki; Enyo, Hiroji; and Takemura, Yasuhiko, 4,625,005, Cl. 526-273.000.

Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, to Murata Manufacturing Co., Ltd. Dielectric ceramic composition. 4,624,935, Cl. 501-134.000.

Sakakibara, Yutaka; Ueda, Hidetaka; and Majima, Kunio, to Yazaki Corporation. Pointer illuminating structure in measuring instrument. 4,625,262, Cl. 362-26.000.

Sakakura, Yasuyuki: *See—*
Shibano, Takeshi; Sakakura, Yasuyuki; Ito, Kiichi; and Higuchi, Kazuhiko, 4,625,059, Cl. 562-600.000.

Sakamoto, Koji: *See—*
Yasuda, Wataru; Sakamoto, Koji; Kaneko, Toshio; and Kanno, Fuchio, 4,624,545, Cl. 355-3.0DD.

Sakamoto, Takao, to Tachikawa Spring Co. Ltd. Body-weight adjusting device of a seat suspension. 4,624,437, Cl. 248-564.000.

Sakashita, Mitsuaki: *See—*
Sasaki, Tadashi; Fujikawa, Yoshihiro; Sakoda, Ryozo; Sakashita, Mitsuaki; and Hibi, Morihide, 4,624,950, Cl. 514-222.000.

Sakoda, Ryozo: *See—*
Sasaki, Tadashi; Fujikawa, Yoshihiro; Sakoda, Ryozo; Sakashita, Mitsuaki; and Hibi, Morihide, 4,624,950, Cl. 514-222.000.

Sakuma, Kiyoshi; Tanimura, Yoshiaki; and Tanaka, Naoki, to Mitsubishi Denki Kabushiki Kaisha. Dual refrigerant cooling system. 4,624,114, Cl. 62-502.000.

Salacuse, Frank, to Super Glue Corporation. Heavy duty clamping system. 4,624,432, Cl. 248-316.500.

Salda, Luciano; Pasqui, Daniele; and Mantovani, Gianni, to M.S. Sistemi Automatici S.r.l. Apparatus for detecting the coloring of moving flat-shaped bodies. 4,624,571, Cl. 356-406.000.

Salomon, S.A.: *See—*
Maboux, Michel; and Paris, Jean, 4,624,065, Cl. 36-120.000.

Salvadori, Paolo: *See—*
Melloni, Piero; Salvadori, Paolo; and Lovisolo, Pier P., 4,624,949, Cl. 514-222.000.

Samcoe Holding Corporation: *See—*
Diggle, Edmund A., Jr.; and Cecere, Andrew P., 4,624,036, Cl. 26-51.400.

Sameca, S.A.: *See—*
Geiser, Markus; and Vandevoir, Claude, 4,624,612, Cl. 414-18.000.

Sande, Walter E.; Stroud, Barrie D.; and Dumdie, Dan P., to ITT Corporation. Foam controller. 4,624,745, Cl. 162-252.000.

Sanden Corporation: *See—*
Koitabashi, Takatoshi, 4,624,354, Cl. 192-84.00C.

Sanders, Richard S.: *See—*
Baker, Ross G., Jr.; Calfee, Richard V.; Sanders, Richard S.; Vandegriff, Joe; and Warren, Jay, 4,624,260, Cl. 128-419.0PG.

Sandoz Pharm. Corp.: *See—*
Jewell, Charles F., Jr.; and Wareing, James R., 4,625,039, Cl. 549-214.000.

Sano, Fumiaki: *See—*
Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; Asami, Kazutomo; and Sugihara, Masahiro, 4,624,630, Cl. 418-63.000.

Sanofi: *See—*
Biziere, Kathleen; Chambon, Jean-Pierre; and Hallot, Andre , 4,624,952, Cl. 514-252.000.
Dormoy, Jean-Robert; and Heymes, Alain, 4,625,033, Cl. 546-113.000.

Santambrogio, Pietro: *See—*
Bresciani, Ferruccio; and Santambrogio, Pietro, 4,624,729, Cl. 156-345.000.

Santen, Sven: *See—*
Hammarskog, Bjorn; Mathisson, Goran; and Santen, Sven, 4,624,059, Cl. 34-20.000.

Santrade Ltd.: *See—*
Danielsson, Mats, 4,624,053, Cl. 30-166.00R.
Stevens, Peter, 4,624,505, Cl. 299-81.000.

Sanyo Electric Co., Ltd.: *See—*
Haku, Hisao; Goto, Kazuyuki; Tanaka, Masayuki; Fukatsu, Takeo; and Kuwano, Yukinori, 4,624,905, Cl. 430-65.000.
Yamakawa, Kiichiro; Yamamoto, Kenji; Kuraseko, Takao; Nukaga, Tadashi; and Yoshizaki, Koichi, 4,624,118, Cl. 68-12.00R.

Sanyo Kokusaku-Pulp Co., Ltd.: *See—*
Shibano, Tomishi; Kimura, Itsuo; Nomoto, Hiroaki; and Maruchi, Sachio, 4,624,893, Cl. 428-327.000.

Saotome, Yasushi; Gokan, Hiroshi; Saigo, Kazuhide; Suzuki, Masayoshi; and Ohnishi, Yoshitake, to NEC Corporation. Silicon-containing novolak resin and resist material and pattern forming method using same. 4,624,909, Cl. 430-192.000.

Sapino, Chester, Jr.: *See—*
Brundidge, Steven P.; Howell, Henry G.; Sapino, Chester, Jr.; and Tann, Chon-Hong, 4,625,020, Cl. 536-18.200.

Sarkozy, Robert F., to BTU Engineering Corporation. CVD boat loading mechanism having a separable, low profile cantilevered paddle assembly. 4,624,638, Cl. 432-253.000.

Sasaki, Masahiko: *See—*
Fujimori, Hiroyoshi; Nagasaki, Tatsuo; Kato, Tadashi; and Sasaki, Masahiko, 4,625,236, Cl. 358-98.000.

Sasaki, Tadashi; Fujikawa, Yoshihiro; Sakoda, Ryozo; Sakashita, Mitsuaki; and Hibi, Morihide, to Nissan Chemical Industries Ltd. Method for treating atherosclerosis hyperlipidema, lipid deposition on arterial walls, or raising the ratio of high density lipoprotein cholesterol to total cholesterol in serum. 4,624,950, Cl. 514-222.000.

Sasaki, Toshiyuki; and Sekiguchi, Tomozo, to Pentel Kabushiki Kaisha. Fluid dispenser. 4,624,594, Cl. 401-176.000.

Sasaki, Yutaka; Nakamura, Toshio; Murata, Hiroshi; and Nakamura, Yoshimi, to Nitto Chemical Industry Co., Ltd. Method for producing aqueous, low-alkali metal, low-alumina silica sols. 4,624,800, Cl. 252-313.200.

SAT: *See—*
Gauthier, Andre , 4,624,715, Cl. 148-6.14R.

Satake Engineering Co., Ltd.: *See—*
Satake, Toshihiko, 4,624,368, Cl. 209-581.000.

Satake, Keigo: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.
Aoki, Katsumichi; Shida, Takafumi; Kanda, Youichi; Satake, Keigo; Yamazaki, Shiro; and Chida, Tsuneaki, 4,624,698, Cl. 71-90.000.

Satake, Toshihiko, to Satake Engineering Co., Ltd. Color sorting apparatus for granular objects. 4,624,368, Cl. 209-581.000.

Sato, Goro; Ogata, Masamitsu; and Hirai, Toshiharu, to Catalysts & Chemicals Industries Co., Ltd. Method for preparing hydrocarbon catalytic cracking catalyst compositions. 4,624,936, Cl. 502-65.000.

Sato, Hiroshi; Kushida, Naoki; and Tanaka, Kazumi, to Canon Kabushiki Kaisha. Heat-sensitive transfer material. 4,624,891, Cl. 428-321.300.

Sato, Shigeru: *See—*
Hayakawa, Takayuki; Nakagawa, Manabu; Fujii, Hideji; and Sato, Shigeru, 4,625,117, Cl. 250-385.000.

Sato, Yoshimitsu: *See—*
Ohtsuka, Shuichi; Matsuoka, Hiroshi; and Sato, Yoshimitsu, 4,624,554, Cl. 355-64.000.

Satoh, Kozaburoh: *See—*
Yamaguchi, Satoru; Satoh, Kozaburoh; Shimizu, Jozo; and Andoh, Haruo, 4,624,883, Cl. 428-212.000.

Satoh, Tohru: *See—*
Mizuno, Tsuneo; Takada, Noboru; Shimura, Michio; Satoh, Tohru; and Matsuda, Tadashi, 4,625,221, Cl. 346-140.00R.

Satou, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Device for transferring lead frame. 4,624,358, Cl. 198-345.000.

Saunders, Gerald A. B.; and Sorbie, Charles, to Queen's University at Kingston. Instrument for elbow surface replacement arthroplasty. 4,624,250, Cl. 128-92.00H.

Saunders, William D.: *See—*
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Sawai, Mikio: *See*—
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Cooke, David J.; Griffiths, Brian J.; John, Vivian B.; and Sawicki, George C., 4,624,794, Cl. 252-8.800.
Sawicki, Nina P. Tamper indicating cover. 4,624,378, Cl. 215-230.000.
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Svesson, Lennart, 4,624,453, Cl. 271-4.000.
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Schaper, Ulf-Armin; Streschnak, Benno; Bloesl, Siegfried; and Sommer, Walter, to Henkel Kommanditgesellschaft auf Aktien. Salicylic acid esters of carbocyclic alcohols as perfumes or scenting agents, perfumery compositions and salicylic acid esters. 4,624,802, Cl. 252-522.00R.
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Brush, Robert W., Jr.; and Scharf, Robert M., 4,624,515, Cl. 339-14.00R.
Schatz, Klaus W.: *See*—
Krambeck, Frederick J.; and Schatz, Klaus W., 4,624,772, Cl. 208-95.000.
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Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, Michael J., to GTE Products Corporation. Process for producing ammonium paratungstate. 4,624,844, Cl. 423-593.000.
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Dahms, Wolfgang, 4,624,857, Cl. 427-8.000.
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Hull, John R.; and Schertz, William W., 4,624,113, Cl. 62-467.000.
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Gibson, Harold R., 4,624,093, Cl. 52-716.000.
Schlegel, Dietrich. Apparatus for separating the liquid portion from the solid portion of a ceramic slip. 4,624,786, Cl. 210-414.000.
Schmid, Gerhard: *See*—
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Abderhalden, Herbert; Marr, Duncan B.; Heimann, Ivan; and Schmid, Jurg, 4,624,020, Cl. 4-651.000.
Schmid, Wolfgang: *See*—
Hentschel, Christian; and Schmid, Wolfgang, 4,625,105, Cl. 250-205.000.
Schmidt, Erwin; and Clauss, Karl, to Hoechst Aktiengesellschaft. Process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide and its non-toxic salts. 4,625,024, Cl. 544-2.000.
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Reyer, Manfred; and Schmidts, Klaus, 4,624,730, Cl. 156-358.000.
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Genesio, Rene; Martinez, Jean P.; and Schmitt, Romain, 4,624,637, Cl. 432-239.000.
Schnatzmeyer, Mark A., to Otis Engineering Corporation. Apparatus for monitoring a parameter in a well. 4,624,309, Cl. 166-66.000.
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Morganson, Stephen A.; and Schneeman, Erin P., 4,624,713, Cl. 134-25.200.
Schneider, Dieter, to Ciba-Geigy Corporation. Process for the preparation of granular dye formulations. 4,624,678, Cl. 8-526.000.
Schneider, Horst W., to Varnas Enterprises. Cyclone separators to prevent or reduce clogging. 4,624,691, Cl. 55-396.000.
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Schneller, Joseph W., to National Gypsum Company. Drywall exterior corner bead. 4,624,087, Cl. 52-254.000.
Schniggenfittig, Gunther: *See*—
Kunkel, Fred; Hummel, Peter; Cappel, Bert; Schniggenfittig, Gunther; and Kerber, Helmut, 4,624,183, Cl. 101-365.000.
Schoeman, Johannes F. Door opener. 4,624,076, Cl. 49-199.000.
Schoettle, Klaus; Sold, Roland; Brinkmann, Uwe; and Wagner, Werner, to BASF Aktiengesellschaft. Tape cassette with liner. 4,624,423, Cl. 242-199.000.
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Austin, Michael; and Schofield, B. Lyle, 4,624,425, Cl. 244-13.000.
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Schon, Georg: *See*—
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Schreiber, Alfons: *See*—
Kreth, Julius; Schreiber, Alfons; and Steinko, Willi, 4,624,166, Cl. 83-699.000.
Schrenker, Helge, to Hewlett-Packard Company. High pressure metering pump. 4,624,625, Cl. 417-20.000.
Schroeder, Daniel R., to Motorola, Inc. Microprocessor reset system. 4,625,274, Cl. 364-200.000.
Schubert, Paul C.: *See*—
Lemberger, Richard R.; Schubert, Paul C.; and Tobin, Steven R., 4,625,315, Cl. 372-38.000.
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Walk, Johann; Studtmann, Rainer; and Haller, Fritz, 4,624,360, Cl. 198-398.000.
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., to Eaton Corporation. Solid state display. 4,624,533, Cl. 350-354.000.
Schutze, Rainer, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e. V. Removable core for the production of tubular structures from fibre reinforced materials. 4,624,874, Cl. 428-36.000.
Schwartzkopf, George, to J. T. Baker Chemical Company. Deep ultraviolet lithographic resist composition and process of using. 4,624,908, Cl. 430-192.000.
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Hanssen, Adalbert; and Schwarz, Jurgen, 4,624,537, Cl. 350-531.000.
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Bredow, Walter; and Schwarze, Albert, 4,624,044, Cl. 29-568.000.
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Micic, Ljubomir; Burth, Rolf D.; Fischer, Thomas; and Schweer, Rainer, 4,625,153, Cl. 315-370.000.
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Schwindt, Benjamin W. Door panel with a mirror side. 4,624,094, Cl. 52-786.000.
SCM Chemicals Limited: *See*—
Robinson, Michael, 4,624,843, Cl. 423-493.000.
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Abbey, Kirk J.; Foss, David J.; and Kunz, Barbara L., 4,624,762, Cl. 204-181.700.
De Graaf, Henry J., 4,624,869, Cl. 427-385.500.
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Scolastico, Carlo; and Braglia, Gabriele, to LPB Istituto Farmaceutico S.p.A. Treatment of involutional brain syndromes and mental decay. 4,624,946, Cl. 514-77.000.
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Scott, Gary L.: *See*—
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Scott, Michael M. Remote video recorder programming apparatus operating over telephone lines. 4,625,080, Cl. 379-104.000.
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Green, Nicola; and Alexander, Stephen, 4,625,015, Cl. 530-324.000.
Scuka, Viktor; and Akerlund, John, to Telefonaktiebolaget LM Ericsson. Overvoltage protector for a device having two parts movable relatively to each other. 4,625,256, Cl. 361-117.000.
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Secifarma S.p.A.: *See*—
Bernini, Giuseppe, 4,625,054, Cl. 562-401.000.
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Arrowsmith, David J.; and Clifford, Andrew W., 4,624,752, Cl. 204-37.600.
Sedillo, Lawrence P.: *See*—
Dawson, Jeffrey C.; McDaniel, Robert R.; and Sedillo, Lawrence P., 4,624,795, Cl. 252-8.553.
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Seidel, Udo, to Minnesota Mining and Manufacturing Company. Electrical connector. 4,624,518, Cl. 339-97.00P.
Seiko Instruments & Electronics Ltd.: *See*—
Shimbo, Masafumi, 4,624,737, Cl. 156-643.000.
Sekiguchi, Tomozo: *See*—
Sasaki, Toshiyuki; and Sekiguchi, Tomozo, 4,624,594, Cl. 401-176.000.
Sekihara, Kensuke; Kuroda, Masao; and Kohno, Hideki, to Hitachi, Ltd. Imaging apparatus using nuclear magnetic resonance. 4,625,171, Cl. 324-312.000.
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Self, David E.: *See*—
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Self Diagnostic Security Devices, Inc.: *See*—
Williamson, Gary L.; and Williamson, Oscar A., 4,625,198, Cl. 340-514.000.
Senter, Peter D.; Lambert, John M.; and Blattler, Walter A., to Dana-Farber Cancer Institute, Inc. Cell-delivery agent. 4,625,014, Cl. 530-300.000.
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Vidal, Jean E.; and Serio, Andre L., 4,624,281, Cl. 137-599.200.
Serono Pharmazeutische Praparate GmbH: *See*—
Voelter, Wolfgang; and Lippert, Theodor, 4,624,804, Cl. 530-366.000.
Shafer, John L.; and Ehrlich, Robert. Method and apparatus for determining conformity of a predetermined shape related characteristics of an object or stream of objects by shape analysis. 4,624,367, Cl. 209-577.000.
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Shah, Vipin D.; and Shah, Nila V., 4,624,916, Cl. 435-7.000.
Shah, Vipin D.; and Shah, Nila V., to International Immunoassay Laboratories, Inc. Process and composition for the rapid quantitation of small levels of creative kinase-MB isoenzyme. 4,624,916, Cl. 435-7.000.
Shannon, Joseph W., to American Business Computers. Automatic wine dispenser. 4,624,391, Cl. 222-53.000.
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Katoh, Itsurou, 4,624,549, Cl. 355-3.0BE.
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Shavers, Glynn S. Speaker enclosure. 4,624,337, Cl. 181-145.000.
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Cameron, Evan S.; and Shaw, Linda P., 4,624,527, Cl. 350-6.500.
Shearer, Nelson W.: *See*—
Yale, Ramon L.; and Shearer, Nelson W., 4,624,861, Cl. 427-65.000.
Sheets, Robert L.: *See*—
Phillips, James D.; and Sheets, Robert L., 4,624,610, Cl. 409-132.000.
Shell Oil Company: *See*—
Baker, Daniel C., 4,624,837, Cl. 423-215.500.
Kemp, Richard A., 4,624,938, Cl. 502-208.000.
Zijsling, Djurre H., 4,624,330, Cl. 175-393.000.
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Shibano, Takeshi; Sakakura, Yasuyuki; Ito, Kiichi; and Higuchi, Kazuhiko, to 501 Mitsubishi Petrochemical Company, Ltd. Process for purification of 1,2-unsaturated carboxylic acids and/or esters thereof. 4,625,059, Cl. 562-600.000.
Shibano, Tomishi; Kimura, Itsuo; Nomoto, Hiroaki; and Maruchi, Sachio, to Sanyo Kokusaku-Pulp Co., Ltd. Pressure-sensitive adhesive tapes or sheets. 4,624,893, Cl. 428-327.000.
Shibata, Norio, to Victor Company of Japan, Limited. Multi-track magnetic head. 4,625,250, Cl. 360-121.000.
Shida, Takafumi: *See*—
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Shifrin, Gordon A.; and Welner, Jerome M., to Hughes Aircraft Company. Spectral analyzer and direction indicator. 4,624,566, Cl. 356-326.000.
Shikama, Shinsuke; Kondou, Mitsushige; Egashira, Nobumasa; and Okada, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Automatic focusing device. 4,625,303, Cl. 369-45.000.
Shimada, Yoshio: *See*—
Takahashi, Satomi; Ueda, Yasuyoshi; Shimada, Yoshio; and Watanabe, Kiyoshi, 4,625,042, Cl. 549-401.000.
Shimadzu Corporation: *See*—
Yoshida, Yoshikazu, 4,625,112, Cl. 250-287.000.
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Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.
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Tsubakimoto, Tsuneo; Shimomura, Tadao; and Irie, Yoshio, 4,625,001, Cl. 526-88.000.
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Fujigaya, Kazuyuki; Ogawa, Naoki; Shimonosono, Hitoshi; and Minezaki, Yutaka, 4,624,221, Cl. 123-41.080.
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Mizuno, Tsuneo; Takada, Noboru; Shimura, Michio; Satoh, Tohru; and Matsuda, Tadashi, 4,625,221, Cl. 346-140.00R.
Shin-Etsu Polymer Co., Ltd.: *See*—
Kawaguchi, Toshiyuki; Nogami, Takashi; and Nei, Koichi, 4,624,801, Cl. 252-500.000.
Shini, Masami, to Fuji Kagakushi Kogyo Co., Ltd. Multiple-use pressure-sensitive transfer recording media. 4,624,881, Cl. 428-207.000.
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Okamoto, Tatsuaki; Miyaguchi, Shoji; Shiraishi, Akira; and Kawaoka, Tsukasa, 4,625,076, Cl. 178-22.110.
Shiraishi, Yasuhiro; and Miyoshi, Makoto, to Nissan Motor Co., Ltd. Fail safe steering effort control system. 4,624,335, Cl. 180-142.000.
Shriver, Joseph S., to Perkin-Elmer Corporation, The. Memory refresh circuit with varying system transparency. 4,625,296, Cl. 364-900.000.
Shutske, Gregory M., to Hoechst-Roussel Pharmaceuticals. 6H-isoxazolo[3,4-d]pyrazolo[3,4-b]pyridines, method for their preparation and use as anxiolytic agents. 4,624,955, Cl. 514-293.000.
Shuttleworth, Kevin P., to Don Bur (Bodies & Trailers) Limited. Sliding door assembly. 4,624,074, Cl. 49-222.000.
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Siedle, Allen R.; and Howells, Richard D., to Minnesota Mining and Manufacturing. Fluorochemical rhodium compounds. 4,625,069, Cl. 568-454.000.
Siegers, Hans P., to Henkel Kommanditgesellschaft auf Aktien. Method for cottonwool tampon. 4,624,668, Cl. 604-904.000.
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Geffcken, Walter, 4,625,148, Cl. 313-485.000.
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Bichler, Helmut, 4,625,181, Cl. 331-57.000.
Held, Kurt, 4,625,194, Cl. 335-271.000.
Witte, Hans-Hermann, 4,625,314, Cl. 371-68.000.
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Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,625,116, Cl. 250-363.00S.
Sierracin Corporation: *See*—
Jaeger, Robert P., 4,625,075, Cl. 178-18.000.
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Steiner, Heinz, 4,624,325, Cl. 173-139.000.
Sigma Corporation: *See*—
Nakagawa, Jihei, 4,624,536, Cl. 350-423.000.
Sigma Research, Inc.: *See*—
Fitzpatrick, Gerald L., 4,625,167, Cl. 324-235.000.
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Burgyan, Lajos, 4,625,246, Cl. 360-62.000.

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Sirasaki, Yuichi: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,625,172, Cl. 324-326.000.

Sisbarro, Frederick P., to Carter-Wallace, Inc. Production of a solid stick in a container. 4,624,810, Cl. 264-25.000.

Skeie, Halvor, to X-Cyte Inc. Surface acoustic wave passive transponder having amplitude and phase-modifying surface pads. 4,625,207, Cl. 342-51.000.

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Hammarskog, Bjorn; Mathisson, Goran; and Santen, Sven, 4,624,059, Cl. 34-20.000.

Skil Corporation: *See*—
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Skinner, James T. Textual comparison system for locating desired character strings and delimiter characters. 4,625,295, Cl. 364-900.000.

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Smith, Harry D., Jr., to Halliburton Company. Epithermal neutron porosity measurement. 4,625,110, Cl. 250-269.000.

Smith, Harry D., Jr., to Halliburton Company. Method and apparatus for pulsed neutron capture measurement of borehole conditions and formation hydrogen index. 4,625,111, Cl. 250-270.000.

Smith, Herman W., to Upjohn Company, The. 6-aryluracils and selected novel intermediates used in the preparation thereof. 4,625,028, Cl. 544-309.000.

Smith, Lawrence G., to Republic Money Orders, Inc. Apparatus for dispensing money orders. 4,625,275, Cl. 364-401.000.

Smith, Leonard S., to Recreational Technologies Inc. Device indicating the time remaining of the useful life of a battery. 4,625,175, Cl. 324-430.000.

Smith, Roddie R.: *See*—
Dickson, Rennie L.; and Smith, Roddie R., 4,624,315, Cl. 166-323.000.

Smith, Thomas E.: *See*—
Gusack, James A.; and Smith, Thomas E., 4,624,817, Cl. 264-225.000.

Smith, Thomas J., to TII Industries, Inc. Station interface and protector apparatus. 4,624,514, Cl. 379-412.000.

Smith, Thomas W.: *See*—
Badesha, Santokh S.; Smith, Thomas W.; and Tarnawskyj, Ihor W., 4,624,701, Cl. 75-0.50A.

Smithco Engineering: *See*—
Rothenbucher, Robert K., 4,624,379, Cl. 220-4.00R.

SmithKline Beckman Corporation: *See*—
Callahan, James F.; Moore, Michael L.; and Yim, Nelson C., 4,624,943, Cl. 514-11.000.

Smyers, Michael K.; and Kay, Jack R., to Polaris Electronics Corp. Method and apparatus for welding a cover on a circuit enclosure. 4,625,091, Cl. 219-86.240.

Snyder, Robert J., to Wang Laboratories, Inc. Frequency modulated message transmission. 4,625,318, Cl. 375-46.000.

Sobstad Sailmakers, Inc.: *See*—
Conrad, Peter G., 4,624,205, Cl. 114-103.000.

Societe Anonyme D.B.A.: *See*—
Carre, Jean-Jacques; and Cheron, Jean-Marc, 4,624,507, Cl. 303-6.00C.
Gerard, Jean-Louis; and Le Marchand, Claude, 4,624,344, Cl. 188-73.360.

Societe Chimique des Charbonnages-CdF Chimie: *See*—
Haas, Armand, 4,624,991, Cl. 525-209.000.

Societe Chimique des Charbonnages S.A.: *See*—
Audureau, Joel; Caron, Michel R.; and Hervais, Vincent, 4,624,823, Cl. 264-569.000.

Societe Nationale Elf Aquitaine (Production): *See*—
de Bazelaire, Eric, 4,624,550, Cl. 355-40.000.

Soderbaum, Ulf: *See*—
Ohlsson, Lars-Erik; Soderbaum, Ulf; and Borgersen, Kjell, 4,624,643, Cl. 440-2.000.

Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward C., to Pitney Bowes Inc. Postage meter with keyboard keys for causing display of data pertaining to meter operation. 4,625,282, Cl. 364-466.000.

Sofec, Inc.: *See*—
Kiely, Willian L.; and Pedersen, Kristen I., 4,624,645, Cl. 441-4.000.

Sold, Roland: *See*—
Schoettle, Klaus; Sold, Roland; Brinkmann, Uwe; and Wagner, Werner, 4,624,423, Cl. 242-199.000.

Soleau, James R. Towrope-handling system monitor for waterskiing. 4,624,141, Cl. 73-865.800.

Solodar, Warren E., to Xerox Corporation. Sulfonated trisazo dyes for ink jet compositions. 4,624,708, Cl. 106-22.000.

Sommer, Walter: *See*—
Schaper, Ulf-Armin; Streschnak, Benno; Bloesl, Siegfried; and Sommer, Walter, 4,624,802, Cl. 252-522.00R.

Sony Corporation: *See*—
Kawakami, Kenji; Horikawa, Norikazu; and Yamamoto, Yoshinori, 4,625,253, Cl. 360-132.000.
Saito, Kengo; Ohtsu, Yasunori; Akahira, Isao; and Inoue, Makoto, 4,625,247, Cl. 360-71.000.

Sorbie, Charles: *See*—
Saunders, Gerald A. B.; and Sorbie, Charles, 4,624,250, Cl. 128-92.00H.

Sorin Biomedica S.p.A.: *See*—
Arru, Pietro; Bona, Gioacchino; Curcio, Maria; and Vallana, Franco, 4,624,822, Cl. 264-544.000.

Spector, George: *See*—
Robinson, Charles A.; Perry, Steven B.; and Spector, George, 4,624,294, Cl. 144-253.00F.

Spencer, Stephanie S.: *See*—
Cearley, James E.; Carruth, John C.; Dixon, Robert C.; Spencer, Stephanie S.; and Zuloaga, Jaime A., Jr., 4,624,826, Cl. 376-327.000.

Spong, Fred W.; and Muchnik, Boris J., to Storage Technology Corporation. Broad band multilayer optical storage structure having a thin metallic optically transmissive layer. 4,625,217, Cl. 346-76.00L.

Spong, Fred W.: *See*—
Muchnik, Boris J.; and Spong, Fred W., 4,625,215, Cl. 346-25.000.

Spraying Systems Co.: *See*—
Ferrazza, Gerald, 4,624,414, Cl. 239-467.000.

Springer, Richard A., to Tektronix, Inc. Method and apparatus for testing electronic equipment. 4,625,313, Cl. 371-20.000.

Springmann, Hermann; and Kosswig, Kurt, to Huels Aktiengesellschaft. Process for the production of carboxymethylated alchols, ether alcohols, thioalcohols, or alkyl phenols. 4,625,057, Cl. 562-470.000.

Squicciarini, Alex J.: *See*—
Vanderveer, Fred; Knipper, Aloysius; Straka, Robert; and Squicciarini, Alex J., 4,624,856, Cl. 426-549.000.

SRI International: *See*—
Green, Philip S., 4,624,143, Cl. 73-620.000.

Stacherski, Raymond: *See*—
Gillett, Daniel D.; and Stacherski, Raymond, 4,625,123, Cl. 290-40.00B.

Stamicarbon B.V.: *See*—
van Hardeveld, Rudolf; van de Mond, Theodorus J.; and Vandenbooren, Franciscus H. A. M. J., 4,625,061, Cl. 564-103.000.

Stanadyne, Inc.: *See*—
Kowal, Steven J., 4,624,225, Cl. 123-90.580.

Stanasolovich, David: *See*—
Nixon, Paul E.; Polavarapu, Murty S.; and Stanasolovich, David, 4,624,739, Cl. 156-643.000.

Standard Microsystems Corporation: *See*—
Pechar, Henry W.; and Li, Tak P., 4,625,321, Cl. 375-116.000.

Standard Oil Company, The: *See*—
Weinert, Raymond J., Jr.; Benton, Kenneth C.; Desmond, Michael J.; Ball, Lawrence E.; and Curatolo, Barbara D., 4,625,002, Cl. 526-90.000.

Standard Oil Company (Indiana): *See*—
Cartmell, Robert R.; and Horecky, Carl J., 4,624,836, Cl. 422-115.000.

Standard Telephone and Cables plc: *See*—
Searle, Jeffrey G.; and Ward, Christopher R., 4,625,211, Cl. 342-374.000.

Standard Telephones and Cables Public Limited Company: *See*—
Antell, George R., 4,625,226, Cl. 357-30.000.
Jackson, Dawn A., 4,625,258, Cl. 361-321.000.
Kelly, Michael B., 4,625,082, Cl. 379-273.000.

Stanley Electric Co., Ltd.: *See*—
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, 4,624,531, Cl. 350-340.000.

Staples, Robert E.: *See*—
Golder, Willis E.; Ierardi, Joseph A.; Staples, Robert E.; and Boyle, Michael C., 4,625,164, Cl. 324-158.00F.

Stauffer Chemical Company: *See*—
Heather, James B., 4,625,065, Cl. 568-27.000.

Staun, Paul R.: *See*—
Ory, William F.; Staun, Paul R.; and Weir, Robert M., 4,624,117, Cl. 68-3.00R.

Stec, Inc.: *See*—
Ono, Hirofumi; Tsujimura, Kiyoharu; Kamo, Masayuki; and Isoda, Yoritaka, 4,624,138, Cl. 73-204.000.

Stefanic, Joseph M., to Armstrong-Blum Mfg. Co. Blade speed control for a band saw. 4,624,167, Cl. 83-802.000.

Stein & Co. GmbH: *See*—
Kaulig, Heinz; and Stein, Klaus, 4,624,025, Cl. 15-41.00R.

Stein, Klaus: *See*—
Kaulig, Heinz; and Stein, Klaus, 4,624,025, Cl. 15-41.00R.

Steinberger, Josef, to Paul Forkardt GmbH & Co. KG. Rotary chuck. 4,624,466, Cl. 279-1.00R.

Steiner, Heinz, to SIG Schweizerische-Industrie Gesellschaft. Apparatus for dampening the recoil of percussion tools. 4,624,325, Cl. 173-139.000.

Steingroever, Dietrich; and Steingroever, Erich. Method for measuring magnetic potentials using hall probes. 4,625,166, Cl. 324-223.000.

Steingroever, Erich: *See*—
Steingroever, Dietrich; and Steingroever, Erich, 4,625,166, Cl. 324-223.000.

Steinke, Wayne. Air vent with floating closure. 4,624,176, Cl. 98-119.000.

Steinko, Willi: *See*—
Kreth, Julius; Schreiber, Alfons; and Steinko, Willi, 4,624,166, Cl. 83-699.000.

Stepanek, Premak: *See*—
Klubitschko, Gerd; and Stepanek, Premak, 4,624,474, Cl. 280-612.000.

Stercken, Karl: *See*—
Rudolph, Gunter W.; Stercken, Karl; and Forster, Eckehard F. O., 4,624,298, Cl. 164-486.000.

Stevens, John W.: *See*—
Bungay, Michael R.; Stevens, John W.; Turner, Richard M.; and Andrews, Richard J., 4,624,135, Cl. 73-119.00A.

Stevens, Peter, to Santrade Ltd. Mineral cutter picks and pick assemblies. 4,624,505, Cl. 299-81.000.

Stevenson, John S., to Texaco Inc. Process for feeding and gasifying solid carbonaceous fuel. 4,624,684, Cl. 48-197.00R.

Stienen, Karl H., to Trohler, Paul, a part interest. Node element and framework bar for tridimensional frameworks. 4,624,090, Cl. 52-648.000.

Stoeckigt, Dieter: *See*—
Balzer, Wolf-Dieter; Lorenz, Klaus; Wolf, Helmut; Trieselt, Wolfgang; Stoeckigt, Dieter; and Hettche, Albert, 4,624,803, Cl. 252-527.000.

Stoffels, Jacobus: *See*—
van Esdonk, Johannes; and Stoffels, Jacobus, 4,625,142, Cl. 313-346.0DC.

Stoner, Donald R.: *See*—
Cheng, Wenche W.; Stoner, Donald R.; and Keller, Harold T., deceased, 4,624,866, Cl. 427-190.000.

Storage Technology Corporation: *See*—
Muchnik, Boris J.; and Spong, Fred W., 4,625,215, Cl. 346-25.000.
Spong, Fred W.; and Muchnik, Boris J., 4,625,217, Cl. 346-76.00L.

Storimans, Franciscus J. A., to Frank Storimans Limited. Belt transporter for electronic components. 4,624,289, Cl. 140-105.000.

Story, Larry D.; and Pittman, Luther B., to Pinkerton Tobacco Company, The. Chewable tobacco based product. 4,624,269, Cl. 131-352.000.

Stotz, Erich; and Horn, Reinhard, to Dr. Ing. h.c.F., Porsche Aktiengesellschaft. Clutch activating device. 4,624,152, Cl. 74-518.000.

Straka, Robert: *See*—
Vanderveer, Fred; Knipper, Aloysius; Straka, Robert; and Squicciarini, Alex J., 4,624,856, Cl. 426-549.000.

Strebel, Michael: *See*—
Hilborn, Howard L.; and Strebel, Michael, 4,625,200, Cl. 340-596.000.

Streschnak, Benno: *See*—
Schaper, Ulf-Armin; Streschnak, Benno; Bloesl, Siegfried; and Sommer, Walter, 4,624,802, Cl. 252-522.00R.

Strimel, Robert S., to Tinius Olsen Testing Machine Co. For testing machines, improvements in determining rupture point and setting gauge length. 4,624,144, Cl. 73-834.000.

Stroem, Sigmunn, to A/S Kongsberg Vapenfabrikk. Variable flow gas turbine engine. 4,624,104, Cl. 60-39.750.

Strohmeier, Helmut. Water gliding shoes. 4,624,646, Cl. 441-76.000.

Strohmeier, Wolfgang, to Blaupunkt-Werke GmbH. Illuminated control panel for communication apparatus, particularly for car radio or radio-recorder combination. 4,625,263, Cl. 362-32.000.

Stromberg, James L., to Halliburton Company. Quick connect coupler. 4,624,483, Cl. 285-24.000.

Strongosky, John M.; and Freund, David M., to RPM Industries, Inc. Stocking display device. 4,624,375, Cl. 211-170.000.

Strosser, Richard P., to New Holland, Inc. Electronic bale density controller. 4,624,180, Cl. 100-41.000.

Stroud, Barrie D.: *See*—
Sande, Walter E.; Stroud, Barrie D.; and Dumdie, Dan P., 4,624,745, Cl. 162-252.000.

Stuart, Clifton F.; and Eskridge, Harold E. Coupling mechanism for coupling fluid and electrical lines between adjacent vehicles. 4,624,472, Cl. 280-420.000.

Stubboio, Louis, to Aire-Wrap, Inc. Method and apparatus for heating and cooling buildings. 4,624,300, Cl. 165-45.000.

Stubbs, George, to Milex Products, Incorporated. Cervical dilator with captive extraction element. 4,624,258, Cl. 128-341.000.

Studtmann, Rainer: *See*—
Walk, Johann; Studtmann, Rainer; and Haller, Fritz, 4,624,360, Cl. 198-398.000.

Stuetz, Dagobert E., to Celanese Corporation. Liquid crystalline polymer substrates with orthogonal molecular orientation. 4,624,872, Cl. 428-1.000.

Styron, Robert W., to Resource Technology, Inc. Light-weight aggregate. 4,624,711, Cl. 106-308.00S.

Sudol, George A.: *See*—
Lake, Ralph J., Jr.; and Sudol, George A., 4,624,434, Cl. 248-454.000.

Suezaki, Yasunaga, to Kaisei Kogyo Corporation. Tree pruning machine. 4,624,293, Cl. 144-2.00Z.

Sugihara, Masahiro: *See*—
Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; Asami, Kazutomo; and Sugihara, Masahiro, 4,624,630, Cl. 418-63.000.

Sugimoto, Kaname, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process for the production of human T-cell growth factor. 4,624,917, Cl. 435-68.000.

Sugise, Ryoji: *See*—
Iwata, Fumio; Harada, Katsumasa; and Sugise, Ryoji, 4,625,025, Cl. 544-53.000.

Sugiura, Toshiharu: *See*—
Nakayasu, Morihiro; Tomizawa, Takekazu; and Sugiura, Toshiharu, 4,624,058, Cl. 34-10.000.

Sullaway, Bob L.: *See*—
Baldridge, Morris G.; and Sullaway, Bob L., 4,624,316, Cl. 166-325.000.

Sumi, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device. 4,625,298, Cl. 365-190.000.

Sumitomo Chemical Company Limited: *See*—
Nagano, Eiki; Takemoto, Ichiki; Fukushima, Masayuki; Yoshida, Ryo; and Matsumoto, Hiroshi, 4,624,699, Cl. 71-92.000.

Sun Chemical Corporation: *See*—
Floyd, William C.; and North, Bernard F., 4,625,029, Cl. 544-309.000.

Sundstrand Corporation: *See*—
Chetty, P. R. K.; Galloway, Gary; and Thollot, Pierre, 4,625,271, Cl. 363-49.000.
Hucker, David J., 4,625,160, Cl. 322-32.000.
Lobsinger, James L.; and Wefel, Jerry D., 4,625,133, Cl. 310-56.000.

Sung, Rodney L.; and Kaufman, Benjamin J., to Texaco Inc. Motor fuel detergent additives. 4,624,682, Cl. 44-71.000.

Super Glue Corporation: *See*—
Salacuse, Frank, 4,624,432, Cl. 248-316.500.

Surgidev Corp.: *See*—
Arimond, Timothy V., 4,624,661, Cl. 604-151.000.
Grendahl, Dennis T., 4,624,669, Cl. 623-5.000.

Survival Technology, Inc.: *See*—
Lopez, Claudio, 4,624,393, Cl. 222-83.500.

Suyama, Tadakazu: *See*—
Fukushima, Tsunekazu; Fujii, Mitsugu; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,624,927, Cl. 436-16.000.

Suzuki, Atsuo: *See*—
Kitsukawa, Motohiko; and Suzuki, Atsuo, 4,624,121, Cl. 72-65.000.

Suzuki, Atsushi: *See*—
Watanabe, Naomitsu; Tomita, Yoshifumi; Suzuki, Atsushi; and Yamamoto, Hajime, 4,625,147, Cl. 313-468.000.

Suzuki, Kazunori: *See*—
Yamanaka, Akihiro; Toshikuni, Masami; and Suzuki, Kazunori, 4,624,792, Cl. 210-759.000.

Suzuki, Keizo; Ninomiya, Ken; Nishimatsu, Shigeru; and Okudaira, Sadayuki, to Hitachi, Ltd. Dry-processing apparatus. 4,624,214, Cl. 118-719.000.

Suzuki, Kenji: *See*—
Fujinawa, Shoji; Hashiba, Isao; Suzuki, Kenji; Tsuchiya, Syuzi; and Takakuwa, Yasuo, 4,625,053, Cl. 562-401.000.

Suzuki, Koichi, to Nissan Motor Co., Ltd. Fuel gauge for vehicles. 4,625,284, Cl. 364-509.000.

Suzuki, Masayoshi: *See*—
Saotome, Yasushi; Gokan, Hiroshi; Saigo, Kazuhide; Suzuki, Masayoshi; and Ohnishi, Yoshitake, 4,624,909, Cl. 430-192.000.

Suzuki, Michio: *See*—
Hiruma, Masao; Nakayama, Hiroshi; and Suzuki, Michio, 4,624,650, Cl. 464-26.000.

Suzuki, Shizuo: *See*—
Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, 4,625,172, Cl. 324-326.000.

Suzuki, Takeshi: *See*—
Yamamoto, Masaichi; Araki, Seiichi; Yamamoto, Hiroshi; Yamatsu, Isao; Suzuki, Takeshi; Kajiwara, Akiharu; Suzuki, Yoshikazu; and Arai, Haruyoshi, 4,624,966, Cl. 514-724.000.

Suzuki, Yoshikazu: *See*—
Yamamoto, Masaichi; Araki, Seiichi; Yamamoto, Hiroshi; Yamatsu, Isao; Suzuki, Takeshi; Kajiwara, Akiharu; Suzuki, Yoshikazu; and Arai, Haruyoshi, 4,624,966, Cl. 514-724.000.

Suzumura, Masanaga: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,624,476, Cl. 280-707.000.

Svenska Traforskningsinstitutet: *See—*
Hartog, Stefan M.; and Hollmark, Bernt H. F., 4,624,819, Cl. 264-510.000.

Svesson, Lennart, to Scan Coil AB. Document counter. 4,624,453, Cl. 271-4.000.

Swain, Henry, to Illinois Tool Works Inc. Stop device. 4,624,364, Cl. 206-328.000.

Swank, Claire A.: *See—*
Kamperman, David R.; Lancy, Leslie E.; and Swank, Claire A., 4,624,790, Cl. 210-665.000.

Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., to Allied Corporation, '. O-diaminophosphinyl derivatives of oximes as urease inhibitors. 4,624,695, Cl. 71-86.000.

Sybron Corporation: *See—*
Melisz, John M.; and Jellinek, Frank H., 4,624,882, Cl. 428-210.000.

Syntex (U.S.A.) Inc.: *See—*
Ullman, Edwin F., 4,624,929, Cl. 436-179.000.

Syrbius, Gerhard: *See—*
Naumann, Gerd; and Syrbius, Gerhard, 4,624,854, Cl. 426-233.000.

Szkaradek, Edward J., to Morehouse Industries, Inc. Media mill outlet assembly. 4,624,418, Cl. 241-46.170.

Szporny, Laszlo : *See—*
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.

Szudy, Gabor: *See—*
Hevesi, Jeno ; Gyapai, Janos; Szudy, Gabor; Nagy, Balint; Vago, Arpad; Gesztelyi, Adamne N.; and Keszler, Jozsef, 4,624,419, Cl. 241-101.00B.

T. I. Domestic Appliances Limited: *See—*
Barnes, Hugh V.; and Russell, William M., 4,624,632, Cl. 431-77.000.

Tachibana, Akihiro: *See—*
Tsukai, Yoshiyuki; and Tachibana, Akihiro, 4,624,526, Cl. 350-3.720.

Tachikawa Spring Co. Ltd.: *See—*
Kazunori, Hashimoto, 4,624,503, Cl. 297-452.000.
Sakamoto, Takao, 4,624,437, Cl. 248-564.000.

Taenzer, Jon C., to Adept Technology, Inc. Motor control circuit for variable reluctance motor. 4,625,158, Cl. 318-701.000.

Taheri, Syde A. Device for aiding cardiocepital venous flow from the foot and leg of a patient. 4,624,244, Cl. 128-24.00R.

Tajima, Masashi: *See—*
Ito, Nobuo; and Tajima, Masashi, 4,624,177, Cl. 99-286.000.

Takada, Noboru: *See—*
Mizuno, Tsuneo; Takada, Noboru; Shimura, Michio; Satoh, Tohru; and Matsuda, Tadashi, 4,625,221, Cl. 346-140.00R.

Takahara, Shoichiro; and Kikuno, Masayuki, to Sharp Kabushiki Kaisha. Edge domain-free liquid crystal display of dot matrix type. 4,624,530, Cl. 350-336.000.

Takahashi, Junji: *See—*
Kanamaru, Hitoshi; Funabashi, Tadashi; Takahashi, Junji; and Kato, Kyoichi, 4,625,304, Cl. 369-75.200.

Takahashi, Satomi; Ueda, Yasuyoshi; Shimada, Yoshio; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing 6-fluoro-4-chromanone using 3-(4-fluorophenoxy)propionitrile. 4,625,042, Cl. 549-401.000.

Takahashi, Yoshikazu: *See—*
Iijima, Masayuki; and Takahashi, Yoshikazu, 4,624,867, Cl. 427-255.600.

Takakuwa, Yasuo: *See—*
Fujinawa, Shoji; Hashiba, Isao; Suzuki, Kenji; Tsuchiya, Syuzi; and Takakuwa, Yasuo, 4,625,053, Cl. 562-401.000.

Takano, Takeshi: *See—*
Itaya, Eiji; Takano, Takeshi; and Nakamura, Takaharu, 4,625,180, Cl. 331-2.000.

Takao, Masatoshi: *See—*
Kimura, Kunio; Takao, Masatoshi; Akahira, Nobuo; and Takenaga, Mutsuo, 4,624,914, Cl. 430-495.000.

Takayanagi, Yoshiaki, to Canon Kabushiki Kaisha. Image density control device. 4,624,548, Cl. 355-14.00D.

Takebe, Satoshi: *See—*
Takezawa, Hatsuo; and Takebe, Satoshi, 4,625,333, Cl. 455-612.000.

Takeda, Keiji, to Fuji Photo Film Co., Ltd. Image recording process. 4,624,910, Cl. 430-203.000.

Takeda, Tohru; and Minagawa, Kazumi, to National Research Institute for Metals. Apparatus for finely dividing molten metal. 4,624,409, Cl. 239-11.000.

Takemoto, Ichiki: *See—*
Nagano, Eiki; Takemoto, Ichiki; Fukushima, Masayuki; Yoshida, Ryo; and Matsumoto, Hiroshi, 4,624,699, Cl. 71-92.000.

Takemura, Yasuhiko: *See—*
Miyabayashi, Toshio; Sakabe, Nobuyuki; Udagawa, Yoshiyuki; Enyo, Hiroji; and Takemura, Yasuhiko, 4,625,005, Cl. 526-273.000.

Takenaga, Mutsuo: *See—*
Kimura, Kunio; Takao, Masatoshi; Akahira, Nobuo; and Takenaga, Mutsuo, 4,624,914, Cl. 430-495.000.

Takeshita, Michitaka, to Bridgestone Corporation. Rubber composition for use in a tire tread. 4,624,977, Cl. 524-87.000.

Takeuchi, Shinichi: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,624,476, Cl. 280-707.000.

Takeuchi, Shinobu. Reel. 4,624,421, Cl. 242-77.000.

Takezawa, Hatsuo; and Takebe, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Duplex optical communication device. 4,625,333, Cl. 455-612.000.

Takiguchi, Eiji, to Bridgestone Corporation. Pneumatic tire suitable for running on snow and ice roads. 4,624,296, Cl. 152-209.00R.

Takiguchi, Keitaro: *See—*
Kuwabara, Takao; and Takiguchi, Keitaro, 4,624,622, Cl. 415-14.000.

Takizawa, Shozo: *See—*
Ohtagaki, Shigeki; Wada, Shunichi; Hata, Yasuaki; Takizawa, Shozo; and Maruyama, Mitsunori, 4,624,478, Cl. 280-707.000.

Takubo, Takayuki, to Victor Company of Japan, Limited. Hand-held TV camera. 4,625,243, Cl. 358-229.000.

Tamaki, Akihiro: *See—*
Nagata, Teruyuki; Tamaki, Akihiro; Ohnishi, Hiroki; and Mizuta, Hideki, 4,625,062, Cl. 564-416.000.

Tamura, Hifumi: *See—*
Umemura, Kaoru; Ishitani, Tohru; Aida, Toshiyuki; and Tamura, Hifumi, 4,624,833, Cl. 420-490.000.

Tan, Sing L.; van de Polder, Leendert J.; De Haan, Gerard; and Vreeswijk, Franciscus W. P., to U.S. Philips Corporation. Color television transmission or data storage system with time division multiplex encoding and data generator and receiver suitable therefor. 4,625,230, Cl. 358-11.000.

Tan, Sing L.: *See—*
Vreeswijk, Franciscus W. P.; Tan, Sing L.; and van de Polder, Leendert J., 4,625,239, Cl. 358-140.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,625,032, Cl. 546-81.000.

Tanahashi, Tooru; and Miyanishi, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for elevator. 4,624,343, Cl. 187-29.00R.

Tanaka, Kazumi: *See—*
Sato, Hiroshi; Kushida, Naoki; and Tanaka, Kazumi, 4,624,891, Cl. 428-321.300.

Tanaka, Masayuki: *See—*
Haku, Hisao; Goto, Kazuyuki; Tanaka, Masayuki; Fukatsu, Takeo; and Kuwano, Yukinori, 4,624,905, Cl. 430-65.000.

Tanaka, Naoki: *See—*
Sakuma, Kiyoshi; Tanimura, Yoshiaki; and Tanaka, Naoki, 4,624,114, Cl. 62-502.000.

Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,624,476, Cl. 280-707.000.

Tanaka, Takao: *See—*
Amano, Osamu; Kaiya, Atsushi; Tanaka, Takao; Akimura, Hitoshi; Tsujihata, Katsuhiro; and Hirata, Kouji, 4,624,976, Cl. 524-13.000.

Tandy Corporation: *See—*
Berger, Michael F., 4,625,301, Cl. 365-222.000.

Tang, Reginald Y.: *See—*
Mares, Frank; Tang, Reginald Y.; Galle, James E.; and Federici, Rose M., 4,625,023, Cl. 540-539.000.

Tani, Satoru, to Fujitsu Limited. Fabrication process for a dielectric isolated complementary integrated circuit. 4,624,047, Cl. 29-576.00W.

Taniguchi, Harusige; and Taniguchi, Kyoko, to Taniguchi, Kyoko. Self-service apparatus for serving foods or drinks. 4,624,613, Cl. 414-9.000.

Taniguchi, Hideki: *See—*
Yokota, Yukinaga; Sawamoto, Yuji; Taniguchi, Hideki; and Okabe, Kazuhiko, 4,625,063, Cl. 564-480.000.

Taniguchi, Kyoko: *See—*
Taniguchi, Harusige; and Taniguchi, Kyoko, 4,624,613, Cl. 414-9.000.

Tanimura, Yoshiaki: *See—*
Sakuma, Kiyoshi; Tanimura, Yoshiaki; and Tanaka, Naoki, 4,624,114, Cl. 62-502.000.

Tann, Chon-Hong: *See—*
Brundidge, Steven P.; Howell, Henry G.; Sapino, Chester, Jr.; and Tann, Chon-Hong, 4,625,020, Cl. 536-18.200.

Tanswell, Paul; Baier, Manfred; and Lenz, Helmut, to Boehringer Mannheim GmbH. Immunochemical process. 4,624,930, Cl. 436-500.000.

Tarnawskyj, Ihor W.: *See—*
Badesha, Santokh S.; Smith, Thomas W.; and Tarnawskyj, Ihor W., 4,624,701, Cl. 75-0.50A.

Tarumi, Niro: *See—*
Izumitani, Tetsuro; Tarumi, Niro; Komiya, Shigeo; and Sawamoto, Takeyuki, 4,625,009, Cl. 526-307.500.

Tassin, Robert L. Truck air deflector. 4,624,497, Cl. 296-1.00S.

Tateishi, Naofumi: *See—*
Yuzawa, Keiji; Matsumoto, Naoaki; Kayahara, Takehiko; Tateishi, Naofumi; and Fukuda, Makoto, 4,624,171, Cl. 84-1.030.

Tatemoto, Minoru: *See—*
Kumagai, Naotake; Tatemoto, Minoru; Oshima, Shunzou; Maruyama, Mitsunori; Wada, Shunichi; and Shimomura, Setsuhiro, 4,624,477, Cl. 280-707.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Takeuchi, Shinichi; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; and Abe, Hiroki, 4,624,476, Cl. 280-707.000.

Taylor, Robert L., to AT&T Bell Laboratories. RFI suppression technique for switching circuits. 4,625,270, Cl. 363-39.000.

TDK Corporation: *See*—
Ishizaki, Hideki; Arioka, Hiroyuki; and Ide, Toshiaki, 4,624,892, Cl. 428-323.000.
Wakayama, Katsuhiko; and Harada, Hiraku, 4,624,797, Cl. 252-62.520.
Technicare Corporation: *See*—
Blaskis, Edward A.; and Carlson, Roland W., 4,625,324, Cl. 378-130.000.
Teepak, Inc.: *See*—
De Jong, Hugo; and Thijs, Hugo, 4,624,873, Cl. 428-36.000.
Teetz, Volker: *See*—
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,624,962, Cl. 514-412.000.
Tegal Corporation: *See*—
Bithell, Roger M.; and Slomowitz, Harry, 4,624,728, Cl. 156-345.000.
Teitsu Denshi Kenkyusho Co., Ltd.: *See*—
Narushima, Isao; and Nakano, Morio, 4,624,127, Cl. 73-1.0DV.
Tektronix, Inc.: *See*—
Penney, Bruce J., 4,625,238, Cl. 358-139.000.
Richmond, Scott C.; and Peterson, James R., 4,625,202, Cl. 340-709.000.
Springer, Richard A., 4,625,313, Cl. 371-20.000.
Weiner, Herbert S.; Mills, William L.; Perkins, Charles E.; Lau, Chi-Leung; Mayhew, Jeffrey P.; and Gordon, Samuel Y., 4,625,288, Cl. 364-521.000.
Telefonaktiebolaget LM Ericsson: *See*—
Scuka, Viktor; and Akerlund, John, 4,625,256, Cl. 361-117.000.
Telefunken Electronic GmbH: *See*—
Maier, Horst, 4,625,229, Cl. 357-81.000.
Telettra, Telefonia Elettronica e Radio S.p.A.: *See*—
Burzi, Giuseppe; Mengoli, Giovanni; and Pogliani, Luciano, 4,625,185, Cl. 333-204.000.
Temme, Heimut; Schoop, Gunther-Dietmar; and Schewinski, Hartmut, to Gewerkschaft Eisenhytte Westfalia. Channel sections for scraper-chain conveyors. 4,624,362, Cl. 198-735.000.
Temple, William A. Mast raising and lowering device. 4,624,204, Cl. 114-91.000.
Tennant Company: *See*—
Olson, Donald L.; and Thomsen, Donald L., 4,624,026, Cl. 15-340.000.
Termorak Oy: *See*—
Pettersson, Bertil; and Thorsstrom, Borje, 4,624,634, Cl. 432-17.000.
ter Wiel, Jan: *See*—
Hegge, Theodorus C. J. M.; and ter Wiel, Jan, 4,624,799, Cl. 252-301.170.
Teshima, Toru: *See*—
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, 4,624,531, Cl. 350-340.000.
Tesini, David A. Wafer for a dental impression for identification purposes. 4,624,640, Cl. 433-71.000.
Testrac, Inc.: *See*—
Faul, Donald; Broussard, Paul P.; and Granger, Donald W., 4,624,130, Cl. 73-40.700.
Testrite, Inc.: *See*—
Holm, Albert E.; and Dorman, Dennis J., 4,624,131, Cl. 73-46.000.
Texaco Inc.: *See*—
Dach, Michael M., 4,624,683, Cl. 48-69.000.
Lane, Philip A.; Schrader, Charles H.; Clausen, Glenn A.; and Self, David E., 4,624,771, Cl. 208-74.000.
Stevenson, John S., 4,624,684, Cl. 48-197.00R.
Sung, Rodney L.; and Kaufman, Benjamin J., 4,624,682, Cl. 44-71.000.
Texas A&M University System, The: *See*—
Lawhon, James T., 4,624,805, Cl. 530-376.000.
Texas Instruments Incorporated: *See*—
McElroy, David J., 4,625,300, Cl. 365-205.000.
Papamichalis, Panos E.; and Doddington, George R., 4,625,286, Cl. 364-513.500.
Thalmann, Alfred, to Georg Fischer Aktiengesellschaft. Molded tapping fitting for connecting a branch line to a pipeline. 4,624,487, Cl. 285-197.000.
Thermalloy Incorporated: *See*—
Jordan, William D.; and Clemens, Donald L., 4,625,260, Cl. 361-386.000.
Thieler, Wolfgang: *See*—
Lutz, Dieter; and Thieler, Wolfgang, 4,624,351, Cl. 192-48.500.
Thijs, Hugo: *See*—
De Jong, Hugo; and Thijs, Hugo, 4,624,873, Cl. 428-36.000.
Thollot, Pierre: *See*—
Chetty, P. R. K.; Galloway, Gary; and Thollot, Pierre, 4,625,271, Cl. 363-49.000.
Thomas & Betts Corporation: *See*—
Blum, Kenneth P., 4,624,520, Cl. 339-97.00R.
Brush, Robert W., Jr.; and Scharf, Robert M., 4,624,515, Cl. 339-14.00R.
Greenwood, William S.; Weinmann, Karl; and Weindel, Reinhold, 4,624,522, Cl. 339-99.00R.
Thomas, Dennis R.: *See*—
LaBerdia, William L.; Kress, Edward S.; and Thomas, Dennis R., 4,624,618, Cl. 414-420.000.
Thomsen, Donald L.: *See*—
Olson, Donald L.; and Thomsen, Donald L., 4,624,026, Cl. 15-340.000.
Thomson CSF.: *See*—
Bourgie, Paul, 4,625,188, Cl. 333-257.000.
Thorsstrom, Borje: *See*—
Pettersson, Bertil; and Thorsstrom, Borje, 4,624,634, Cl. 432-17.000.
Thosath, James P. Window stop. 4,624,085, Cl. 52-204.000.
Thottathil, John K., to E. R. Squibb & Sons, Inc. (25-trans)-4-substituted-2-pyrrolidines-methanols. 4,625,038, Cl. 548-570.000.
Tiemann, Jerome J.: *See*—
Vogelsong, Thomas L.; and Tiemann, Jerome J., 4,625,293, Cl. 364-606.000.
TII Industries, Inc.: *See*—
Smith, Thomas J., 4,624,514, Cl. 379-412.000.
Tilli, Vincent: *See*—
Zauderer, Bert; and Tilli, Vincent, 4,624,191, Cl. 110-264.000.
Timex Corporation: *See*—
Dorfman, Leonard M., 4,624,529, Cl. 350-334.000.
Tinius Olsen Testing Machine Co.: *See*—
Strimel, Robert S., 4,624,144, Cl. 73-834.000.
Tinker, Darrell E.; and Dujari, Shyam, to Zilog, Inc. Clock generator for providing non-overlapping clock signals. 4,625,126, Cl. 307-262.000.
Tipper Tie, Inc.: *See*—
Tomczak, Roman M.; Babcock, William W.; and Petsche, Lee E., 4,624,029, Cl. 17-1.00R.
Tisdale, William R. H.: *See*—
Kim, Kap S.; Tisdale, William R. H.; Andrews, Bruce S.; Nash, T. Randolph; Kolodgie, Kathleen J.; and Eiserike, Steven S., 4,625,308, Cl. 370-104.000.
TMC Corporation: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; and Kruschik, Klaus, 4,624,475, Cl. 280-618.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,625,003, Cl. 526-119.000.
Tobin, Steven R.: *See*—
Lemberger, Richard R.; Schubert, Paul C.; and Tobin, Steven R., 4,625,315, Cl. 372-38.000.
Toda, Takao: *See*—
Endo, Makoto; Ono, Satoshi; Toda, Takao; Kashiwagi, Kazuo; Yanagi, Masaaki; and Saito, Yoshihiro, 4,624,547, Cl. 355-14.00E.
Tokita, Jirou: *See*—
Simada, Tamotu; Harada, Yoshinori; Kambara, Hideki; Nagai, Keiichi; and Tokita, Jirou, 4,624,769, Cl. 204-301.000.
Tokuhara, Mitsuhiro; and Ogawa, Hiroshi, to Canon Kabushiki Kaisha. Slit exposure projection device. 4,624,555, Cl. 355-71.000.
Tokyo Electric Co., Ltd.: *See*—
Ochiai, Kuniaki; Horii, Masami; Komakine, Shigeo; and Tsuyuki, Shinzi, 4,624,589, Cl. 400-124.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Matsuura, Hiroshi; and Nitta, Tsuneo, 4,625,287, Cl. 364-513.500.
Satou, Takeo, 4,624,358, Cl. 198-345.000.
Takezawa, Hatsuo; and Takebe, Satoshi, 4,625,333, Cl. 455-612.000.
Tomita, Seiji; Morinaga, Kaoru; and Kotoda, Yoshihiro, 4,625,251, Cl. 360-130.210.
Toledo Stamping & Manufacturing Company: *See*—
Wherry, Joseph L.; and Patel, Ramanlal L., 4,624,223, Cl. 123-90.440.
Tom, Ha: *See*—
Chong, Lawrence; and Tom, Ha, 4,625,244, Cl. 358-335.000.
Tomchany, Michael: *See*—
Long, Harry F.; Misselhorn, Donald J.; and Tomchany, Michael, 4,624,213, Cl. 118-300.000.
Tomczak, Roman M.; Babcock, William W.; and Petsche, Lee E., to Tipper Tie, Inc. Shirring device. 4,624,029, Cl. 17-1.00R.
Tomita, Osamu: *See*—
Murase, Yoshihiko; Nishimura, Seiya; and Tomita, Osamu, 4,624,460, Cl. 273-167.00H.
Tomita, Seiji; Morinaga, Kaoru; and Kotoda, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape recorder. 4,625,251, Cl. 360-130.210.
Tomita, Yoshifumi: *See*—
Watanabe, Naomitsu; Tomita, Yoshifumi; Suzuki, Atsushi; and Yamamoto, Hajime, 4,625,147, Cl. 313-468.000.
Tomizawa, Takekazu: *See*—
Nakayasu, Morihiro; Tomizawa, Takekazu; and Sugiura, Toshiharu, 4,624,058, Cl. 34-10.000.
Tommis, Norman, to Ae Plc. Compositions of matter and their manufacture. 4,624,831, Cl. 419-20.000.
Tomono, Akira, to Nippon Telegraph & Telephone Public Corp. Piezoelectric actuator using bimorph element. 4,625,137, Cl. 310-317.000.
Tomono, Makoto: *See*—
Haneda, Satoshi; Itaya, Masahiko; and Tomono, Makoto, 4,624,559, Cl. 355-14.00D.
Tomosada, Masahiro: *See*—
Komiya, Yutaka; Tomosada, Masahiro; Nakamura, Shinichi; Miyata, Masanori; Adachi, Hideki; and Hirose, Masayuki, 4,625,156, Cl. 318-85.000.
Tone, Junsuke: *See*—
Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, 4,625,041, Cl. 549-343.000.
Tontarelli, Sergio. Multi-purpose container which may be reduced in height. 4,624,382, Cl. 220-8.000.
Toogood, Kevin C., to Procter & Gamble Company, The. Antimicrobial lozenges. 4,624,849, Cl. 424-78.000.

Toshiba Ceramics Co., Ltd.: *See*—
Koyama, Masao; Matuo, Syuitu; Nakayama, Chiaki; and Hoshina, Katsumi, 4,624,735, Cl. 156-610.000.
Toshiba Silicone Co., Ltd.: *See*—
Saito, Nobuhiro, 4,625,043, Cl. 556-442.000.
Toshikuni, Masami: *See*—
Yamanaka, Akihiro; Toshikuni, Masami; and Suzuki, Kazunori, 4,624,792, Cl. 210-759.000.
'totes', incorporated: *See*—
Allen, James H., 4,624,276, Cl. 135-20.00R.
Toti, Daniela: *See*—
Lazzarini, Anna M.; Scarponi, Ugo; de Castiglione, Roberto; Ceserani, Roberto; Castello, Renato; Vaghi, Fabrizio; and Toti, Daniela, 4,624,956, Cl. 514-301.000.
Toto Ltd.: *See*—
Kobayashi, Hiroshi; Sawai, Mikio; Mieda, Junji; and Yoshikubo, Seiichi, 4,624,631, Cl. 431-9.000.
Totten, George E.: *See*—
Harding, Ronald H.; and Totten, George E., 4,624,299, Cl. 165-1.000.
Townsend, Douglas W.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,624,766, Cl. 204-294.000.
Toya, Tatsuro: *See*—
Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 4,625,227, Cl. 357-68.000.
Toyo Boseki Kabushiki Kaisha (Toyobo Co., Ltd.): *See*—
Kurita, Kazuo; and Ishihara, Hideaki, 4,624,816, Cl. 264-210.700.
Toyo Engineering Corporation: *See*—
Hidaki, Morihisa, 4,624,841, Cl. 423-359.000.
Toyo Seikan Kaisha Limited: *See*—
Fujimoto, Hiroshi, 4,624,387, Cl. 220-273.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Kumoi, Sadakatsu; Mitarai, Keiji; and Tsutsumi, Yukihiro, 4,625,064, Cl. 564-486.000.
Toyoda Gosei Co., Ltd.: *See*—
Miyazaki, Takeshi, 4,624,429, Cl. 248-56.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Adachi, Yoshiharu; Kozakai, Asao; Watanabe, Shingo; Nakanishi, Nobuyasu; Oka, Hiroyuki; and Nakagawa, Fumio, 4,624,508, Cl. 303-116.000.
Itoh, Hiroshi; and Okada, Mituhiko, 4,624,153, Cl. 74-689.000.
Watanabe, Tomoyuki, 4,624,349, Cl. 192-0.076.
Yoshida, Ichiro; Atsumi, Morihiro; Yamaguchi, Shunzo; Nakamura, Naotaka; and Yagi, Kenji, 4,625,085, Cl. 200-19.00R.
Traco: *See*—
Randall, Robert P., 4,624,073, Cl. 49-161.000.
Traiteur, Rene : *See*—
Baudoin, Andre ; and Traiteur, Rene , 4,624,217, Cl. 122-32.000.
Transamerica Delaval Inc.: *See*—
Le, Da H., 4,624,662, Cl. 604-249.000.
Transmatic, Incorporated: *See*—
Mikalonis, Liudas K., 4,625,267, Cl. 362-150.000.
Traun, Jerel P.: *See*—
Jorgensen, Jorgen A.; Nygren, Donald W.; Kluge, Douglas J.; and Traun, Jerel P., 4,625,087, Cl. 219-10.55F.
Travenol European Research and Development Centre (TERADEC): *See*—
Peluso, Francesco; and Balteau, Patrick, 4,624,664, Cl. 604-256.000.
Traver, Jack J.; Palmer, C. Dale; and Hughes, Richard, to Traver Tool Company. Downhole mobility and propulsion apparatus. 4,624,306, Cl. 166-53.000.
Traver Tool Company: *See*—
Traver, Jack J.; Palmer, C. Dale; and Hughes, Richard, 4,624,306, Cl. 166-53.000.
Trendel, Alois F., to Owens-Illinois, Inc. Container restraint system. 4,624,098, Cl. 53-314.000.
Treptow, Warren L.; Park, Chung P.; and Hyun, Kun S., to Dow Chemical Company, The. Crosslinked silane-functional vinylidene chloride polymer and films or foams therefrom. 4,624,969, Cl. 521-60.000.
Tretyak, Ivan J.: *See*—
Maximovich, Georgy G.; Ganysh, Yaroslav V.; Shatinsky, Viktor F.; Ljuty, Evgeny M.; and Tretyak, Ivan J., 4,624,871, Cl. 427-431.000.
Trieselt, Wolfgang: *See*—
Balzer, Wolf-Dieter; Lorenz, Klaus; Wolf, Helmut; Trieselt, Wolfgang; Stoeckigt, Dieter; and Hettche, Albert, 4,624,803, Cl. 252-527.000.
Triplett, James T.: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; and Triplett, James T., 4,624,720, Cl. 156-86.000.
Trischler, Ferenc: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.
Trohler, Paul: *See*—
Stienen, Karl H., 4,624,090, Cl. 52-648.000.
Trosdorff, Willi: *See*—
Volbel, Klaus-Dieter; and Trosdorff, Willi, 4,624,719, Cl. 156-60.000.
Trotta, Robert A.: *See*—
Apprille, Domenic V., Jr.; Chesnauskas, Ralph J.; Jacobson, Chester F.; and Trotta, Robert A., 4,624,051, Cl. 30-50.000.
Tru-Cut, Inc.: *See*—
Pinto, Ross E., 4,624,321, Cl. 172-15.000.
Truitt, Kenneth E.: *See*—
Larrick, James W.; Raubitschek, Andrew R.; and Truitt, Kenneth E., 4,624,921, Cl. 435-172.200.
TRW Repa GmbH: *See*—
Wier, Franz, 4,624,035, Cl. 24-642.000.
Tsubakimoto, Tsuneo; Shimomura, Tadao; and Irie, Yoshio, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for continuous production of cross-linked polymer. 4,625,001, Cl. 526-88.000.
Tsuchida, Eishun: *See*—
Matsuda, Hiro; Nakanishi, Hachiro; Kato, Masao; Orihashi, Yuji; Kobayashi, Norihisa; and Tsuchida, Eishun, 4,624,756, Cl. 204-59.00R.
Tsuchiya, Syuzi: *See*—
Fujinawa, Shoji; Hashiba, Isao; Suzuki, Kenji; Tsuchiya, Syuzi; and Takakuwa, Yasuo, 4,625,053, Cl. 562-401.000.
Tsui, Cyrus Y.: *See*—
Fitzpatrick, Mark E.; Tsui, Cyrus Y.; Chan, Andrew K.; and Chan, Albert L., 4,625,311, Cl. 371-15.000.
Tsujihata, Katsuhiro: *See*—
Amano, Osamu; Kaiya, Atsushi; Tanaka, Takao; Akimura, Hitoshi; Tsujihata, Katsuhiro; and Hirata, Kouji, 4,624,976, Cl. 524-13.000.
Tsujimura, Kiyoharu: *See*—
Ono, Hirofumi; Tsujimura, Kiyoharu; Kamo, Masayuki; and Isoda, Yoritaka, 4,624,138, Cl. 73-204.000.
Tsukai, Yoshiyuki; and Tachibana, Akihiro, to Pioneer Electronic Corporation. Optical pickup device. 4,624,526, Cl. 350-3.720.
Tsutsui, Toshio: *See*—
Miyauchi, Terukatsu; Ikeda, Yoneichi; Nakagawa, Takao; Tsutsui, Toshio; and Kikuchi, Tatsuji, 4,624,807, Cl. 264-12.000.
Tsutsumi, Shuji; Yamaguchi, Yoshirou; and Kageyama, Satoru, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Paper coating composition comprising PVA containing acetoacetyl group and a pigment. 4,624,985, Cl. 524-803.000.
Tsutsumi, Yukihiro: *See*—
Kumoi, Sadakatsu; Mitarai, Keiji; and Tsutsumi, Yukihiro, 4,625,064, Cl. 564-486.000.
Tsuyuki, Shinzi: *See*—
Ochisi, Kuniaki; Horii, Masami; Komakine, Shigeo; and Tsuyuki, Shinzi, 4,624,589, Cl. 400-124.000.
Tucker, Charles R.: *See*—
Phifer, John E.; Tucker, Charles R.; and Garst, Roger H., 4,624,793, Cl. 252-8.600.
Tuckner, Ronald F.: *See*—
Richardson, Michael M.; Tuckner, Ronald F.; and Schaffer, Douglas A., 4,624,590, Cl. 400-134.600.
Tuenkers Maschinenbau GmbH: *See*—
Volbel, Klaus-Dieter; and Trosdorff, Willi, 4,624,719, Cl. 156-60.000.
Tuithof, Hans H.: *See*—
Meyer, Albertus C.; Tuithof, Hans H.; and Mulder, Jacobus, 4,625,168, Cl. 324-300.000.
Tukazaki, Hisanobu; Kondo, Kazuo; and Matsumoto, Syuzo, to Hitachi, Ltd. Charge coupled device provided with automatic bias-voltage setting means. 4,625,322, Cl. 377-58.000.
Tulpule, Bhalchandra R.; and Blaha, Matthew S., to United Technologies Corporation. Apparatus for interfacing between at least one channel and at least one bus. 4,625,307, Cl. 370-85.000.
Tunks, Larry M. Self-priming pump. 4,624,627, Cl. 417-199.00A.
Turner, Andrew D.: *See*—
Pottinger, John S.; Turner, Andrew D.; Bowen, William R.; and Cox, Dennis R., 4,624,760, Cl. 204-141.500.
Turner, John H. W.: *See*—
Laundon, Roy D.; Wickens, Anthony J.; and Turner, John H. W., 4,624,845, Cl. 423-633.000.
Turner, Richard M.: *See*—
Bungay, Michael R.; Stevens, John W.; Turner, Richard M.; and Andrews, Richard J., 4,624,135, Cl. 73-119.00A.
Ube Cycon, Ltd.: *See*—
Amano, Osamu; Kaiya, Atsushi; Tanaka, Takao; Akimura, Hitoshi; Tsujihata, Katsuhiro; and Hirata, Kouji, 4,624,976, Cl. 524-13.000.
Ube Industries, Ltd.: *See*—
Iwata, Fumio; Harada, Katsumasa; and Sugise, Ryoji, 4,625,025, Cl. 544-53.000.
Uchida, Tatsuo: *See*—
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Miyabayashi, Toshio; Sakabe, Nobuyuki; Udagawa, Yoshiyuki; Enyo, Hiroji; and Takemura, Yasuhiko, 4,625,005, Cl. 526-273.000.
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Sakakibara, Yutaka; Ueda, Hidetaka; and Majima, Kunio, 4,625,262, Cl. 362-26.000.
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Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, to Brother Industries, Ltd. Electronic typewriter with removable display cursor. 4,624,587, Cl. 400-83.000.

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Ueno, Kouji, to Fujitsu Limited. Electronic circuit device having a power supply level switching circuit. 4,625,129, Cl. 307-446.000.

Uher, Michael L. Retractable ramp assembly for pick-up truck. 4,624,619, Cl. 414-537.000.

Ullman, Edwin F., to Syntex (U.S.A.) Inc. Sample collector and assay device and method for its use. 4,624,929, Cl. 436-179.000.

Ultimatte Corporation: *See—*
Vlahos, Petro, 4,625,231, Cl. 358-22.000.

Umemura, Kaoru; Ishitani, Tohru; Aida, Toshiyuki; and Tamura, Hifumi, to Hitachi, Ltd. Liquid metal ion source and apparatus. 4,624,833, Cl. 420-490.000.

Union Carbide Corporation: *See—*
Best, Donald C., 4,625,030, Cl. 544-358.000.
Chao, Herbert S.; and Kelsey, Donald R., 4,625,000, Cl. 525-534.000.
Dickinson, Eric M., 4,624,775, Cl. 208-131.000.
Harding, Ronald H.; and Totten, George E., 4,624,299, Cl. 165-1.000.
Pelton, John F., 4,624,128, Cl. 73-19.000.
Robeson, Lloyd M.; and Harris, James E., 4,624,997, Cl. 525-471.000.

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Pottinger, John S.; Turner, Andrew D.; Bowen, William R.; and Cox, Dennis R., 4,624,760, Cl. 204-141.500.

United States Medical Corporation: *See—*
Meyer, Benjamin S., 4,624,673, Cl. 623-16.000.

United States of America
Air Force: *See—*
Chang, Yi M.; and Fenwick, James R., 4,624,388, Cl. 220-435.000.
Lawrence, Gene W.; and Davis, Thomas L., 4,625,209, Cl. 342-169.000.
O'Loughlin, James P., 4,625,316, Cl. 372-74.000.
Vogelsong, Thomas L.; and Tiemann, Jerome J., 4,625,293, Cl. 364-606.000.
Army: *See—*
Atzrott, John E., 4,624,427, Cl. 244-152.000.
Ballato, Arthur, 4,625,138, Cl. 310-320.000.
Bender, Edward J.; Patrick, E. Vincent; and Franseen, Richard E., 4,625,106, Cl. 250-213.0VT.
Bovino, Lawrence J.; Weiner, Maurice; and Burke, Terence, 4,625,182, Cl. 331-107.00G.
Emerson, John D., 4,624,185, Cl. 102-293.000.
Johnson, John L., 4,624,563, Cl. 356-152.000.
Energy: *See—*
Gee, James M.; and Hargis, Philip J., Jr., 4,624,736, Cl. 156-643.000.
Hull, John R.; and Schertz, William W., 4,624,113, Cl. 62-467.000.
National Aeronautics and Space Administration: *See—*
Heyman, Joseph S., 4,624,142, Cl. 73-597.000.
St. Clair, Terry L.; and Maudgal, Shubha, 4,624,888, Cl. 428-262.000.
National Aeronautics and Space Adminstration: *See—*
Exton, Reginald J., 4,624,561, Cl. 356-28.500.
Navy: *See—*
Singer, Paul A.; and Conrath, James L., 4,625,332, Cl. 455-67.000.

U.S. Philips Corporation: *See—*
Gerritsen, Jan; Barten, Piet G. J.; and Mensies, Otto, 4,625,145, Cl. 313-413.000.
Kasperkovitz, Wolfdietrich G.; and Dullemond, Dirk J., 4,625,131, Cl. 307-540.000.
Kitzen, Wilhelmus J. W.; and Geelen, Mathias H., 4,625,326, Cl. 381-17.000.
Meyer, Albertus C.; Tuithof, Hans H.; and Mulder, Jacobus, 4,625,168, Cl. 324-300.000.
Sluijter, Robert J.; and Kotmans, Hendrik J., 4,625,327, Cl. 381-49.000.
Tan, Sing L.; van de Polder, Leendert J.; De Haan, Gerard; and Vreeswijk, Franciscus W. P., 4,625,230, Cl. 358-11.000.
van Esdonk, Johannes; and Stoffels, Jacobus, 4,625,142, Cl. 313-346.0DC.
Van Gorkum, Aart A., 4,625,146, Cl. 313-414.000.
Vreeswijk, Franciscus W. P.; Tan, Sing L.; and van de Polder, Leendert J., 4,625,239, Cl. 358-140.000.

U.S. Phillips Corporation: *See—*
Nillesen, Antonius H. H. J., 4,625,232, Cl. 358-23.000.

United States Surgical Corporation: *See—*
McGarry, Richard A.; and Noiles, Douglas G., 4,624,254, Cl. 128-325.000.

United Technologies Automotive, Inc.: *See—*
Perach, Asi, 4,624,285, Cl. 137-625.650.

United Technologies Corporation: *See—*
Couch, Robert P., 4,625,280, Cl. 364-431.020.
Lamm, Foster P.; and Pike, Roscoe A., 4,624,725, Cl. 156-310.000.
Scola, Daniel A.; and Pater, Ruth H., 4,624,727, Cl. 156-331.800.
Tulpule, Bhalchandra R.; and Blaha, Matthew S., 4,625,307, Cl. 370-85.000.

Universe, Samy F. Garment hanger. 4,624,396, Cl. 223-92.000.

University of California, The Regents of The: *See—*
Li, Choh H.; Chung, David; Hammonds, R. Glenn, Jr.; and Ramasharma, Kristipati, 4,624,944, Cl. 514-12.000.

University of Florida: *See—*
White, Keith D., 4,625,290, Cl. 364-522.000.

University of Medicine and Dentistry of New Jersey: *See—*
Prockop, Darwin J., 4,625,016, Cl. 530-338.000.

Upadhyaya, Janardan D., to Moore and Munger, Inc. Method for depolymerizing polymers. 4,624,993, Cl. 525-388.000.

Upjohn Company, The: *See—*
Smith, Herman W., 4,625,028, Cl. 544-309.000.

Urbach, Hansjorg: *See—*
Henning, Rainer; Urbach, Hansjorg; Geiger, Rolf; Teetz, Volker; and Scholkens, Bernward, 4,624,962, Cl. 514-412.000.

Ushiro, Masayuki, to Kyoto Kikai Kogu Kabushiki Kaisha. Tube container squeezer. 4,624,394, Cl. 222-103.000.

USM Corporation: *See—*
Hawkswell, Victor T., 4,624,050, Cl. 29-740.000.

USV Pharmaceutical Corp.: *See—*
Neiss, Edward S.; Desai, Rohit M.; and Youssefyeh, Raymond D., 4,625,034, Cl. 546-152.000.

Vachhani, Vasantrai A., to ADC Telecommunications. Electrical connector and method. 4,624,521, Cl. 339-97.00P.

Vaghi, Fabrizio: *See—*
Lazzarini, Anna M.; Scarponi, Ugo; de Castiglione, Roberto; Ceserani, Roberto; Castello, Renato; Vaghi, Fabrizio; and Toti, Daniela, 4,624,956, Cl. 514-301.000.

Vago, Arpad: *See—*
Hevesi, Jeno ; Gyapai, Janos; Szudy, Gabor; Nagy, Balint; Vago, Arpad; Gesztelyi, Adamne N.; and Keszler, Jozsef, 4,624,419, Cl. 241-101.00B.

Vahasarja, Tauno J.: *See—*
Kallioinen, Jouko O.; Vahasarja, Tauno J.; and Repo, Arvo, 4,624,777, Cl. 209-170.000.

Valcavi, Umberto; Farina, Paolo; and Marotta, Vittorio, to Istituto Biochimico Italiano Giovanni Lorenzini S.p.A. High yield process for preparing beta-lactam antibiotics having a high purity degree. 4,625,021, Cl. 540-230.000.

Valcor Engineering Corporation: *See—*
Kreitchman, Morton A.; and Arnold, Kurt, 4,624,441, Cl. 251-30.010.

Valeo: *See—*
Jaccod, Michel, 4,624,651, Cl. 474-13.000.

Vallana, Franco: *See—*
Arru, Pietro; Bona, Gioacchino; Curcio, Maria; and Vallana, Franco, 4,624,822, Cl. 264-544.000.

Valle, Mario: *See—*
Alberti, Adriano; and Valle, Mario, 4,624,202, Cl. 112-313.000.

Valtakari, Urho V.: *See—*
Dahlberg, Kjell A. M.; and Valtakari, Urho V., 4,624,416, Cl. 241-1.000.

Vamatex S.p.A.: *See—*
Pezzoli, Luigi, 4,624,288, Cl. 139-449.000.

Van Duprin, Inc.: *See—*
Hoffman, Herbert W.; Cohrs, Richard B.; and Dye, William P., 4,624,120, Cl. 70-380.000.

Vanbeersel, Jozef: *See—*
Van Dijck, Francis; Peeters, Johan; and Vanbeersel, Jozef, 4,624,879, Cl. 428-102.000.

VanBrunt, Michael K., to G&H Technology, Inc. Cable shield termination means. 4,625,072, Cl. 174-35.00R.

Vandegriff, Joe: *See—*
Baker, Ross G., Jr.; Calfee, Richard V.; Sanders, Richard S.; Vandegriff, Joe; and Warren, Jay, 4,624,260, Cl. 128-419.0PG.

van de Mond, Theodorus J.: *See—*
van Hardeveld, Rudolf; van de Mond, Theodorus J.; and Vandenbooren, Franciscus H. A. M. J., 4,625,061, Cl. 564-103.000.

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van den Bosch, Francois J. G. Non-invasive reflectance spectrophotometric apparatus. 4,624,572, Cl. 356-418.000.

van de Polder, Leendert J.: *See—*
Tan, Sing L.; van de Polder, Leendert J.; De Haan, Gerard; and Vreeswijk, Franciscus W. P., 4,625,230, Cl. 358-11.000.
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Van Der Borght, Jacques A., to Van Der Borght, Jacques A. Method and apparatus to improve well water quality. 4,624,319, Cl. 166-369.000.

Vanderpool, Clarence D.; MacInnis, Martin B.; and Ladd, Judith A., to GTE Products Corporation. Recovery of tungsten, scandium, iron, and manganese values from tungsten bearing material. 4,624,703, Cl. 75-101.00R.

Vanderpool, Clarence D.: *See—*
Scheithauer, Richard A.; Vanderpool, Clarence D.; MacInnis, Martin B.; and Miller, Michael J., 4,624,844, Cl. 423-593.000.

Vanderveer, Fred; Knipper, Aloysius; Straka, Robert; and Squicciarini, Alex J., to Nabisco Brands, Inc. Method and composition for soft edible baked products having improved extended shelf-life and an edible firm gel for use therein. 4,624,856, Cl. 426-549.000.

van der Wal, Gillis P.: *See—*
Mijers, Jan. W. M.; and van der Wal, Gillis P., 4,624,660, Cl. 604-136.000.

Vandevoir, Claude: *See—*
Geiser, Markus; and Vandevoir, Claude, 4,624,612, Cl. 414-18.000.

Van Dijck, Francis; Peeters, Johan; and Vanbeersel, Jozef, to N.V. Raychem S.A. Recoverable article. 4,624,879, Cl. 428-102.000.

van Eadonk, Johannes; and Stoffels, Jacobus, to U.S. Philips Corporation. Methods of manufacturing a dispenser cathode and dispenser cathode manufactured according to the method. 4,625,142, Cl. 313-346.0DC.

Van Gorkum, Aart A., to U.S. Philips Corporation. Cathode ray tube. 4,625,146, Cl. 313-414.000.

van Hardeveld, Rudolf; van de Mond, Theodorus J.; and Vandenbooren, Franciscus H. A. M. J., to Stamicarbon B.V. Process for preparing cyanamide. 4,625,061, Cl. 564-103.000.

Vannier, Jean; and Mourrier, Francis, to Clextral. Screw element for a material processing machine. 4,624,577, Cl. 366-83.000.

Van Rijen, J. G.; and Houben, Jan P., to Skil Corporation. Surface sander. 4,624,078, Cl. 51-170.0MT.

van Tao, Nguyen; and Bellmann, Gunter, to Battelle Development Corporation. Photo setting composition for coating substrates with an abrasion-resistant transparent or translucent film. 4,624,971, Cl. 522-37.000.

Varel Manufacturing Company: *See—*
Evans, Robert F.; and Davis, Randy C., 4,624,329, Cl. 175-374.000.

Varnas Enterprises: *See—*
Schneider, Horst W., 4,624,691, Cl. 55-396.000.

Vassal, Jean-Marie J.: *See—*
Malagola, Philippe A.; and Vassal, Jean-Marie J., 4,624,750, Cl. 204-26.000.

Vatunen, Markku T., to Oy A W Enbom AB. Device for the purification of gases. 4,624,688, Cl. 55-238.000.

Veite, Harry. Pressure regulating and relief valve. 4,624,277, Cl. 137-116.300.

Vericard Corporation: *See—*
Benton, William M.; and Mee, William W., 4,625,276, Cl. 364-408.000.

VerMehren, H. Richard. Carrier sheet assembly including continuously overlapped envelopes and letter heads. 4,624,408, Cl. 229-69.000.

Victor Company of Japan, Limited: *See—*
Shibata, Norio, 4,625,250, Cl. 360-121.000.
Takubo, Takayuki, 4,625,243, Cl. 358-229.000.

Vidal, Jean E.; and Serio, Andre L., to Compagnie Francaise des Petroles. Control valve. 4,624,281, Cl. 137-599.200.

Vidas, Aaron L. Door locking and restraining mechanism. 4,624,492, Cl. 292-263.000.

Vigreux, Daniel, to Ferco International Usine de Ferrures de Batiment. Fitting for a two-way opening window with means for locking the window in one direction. 4,624,075, Cl. 49-192.000.

Vikar nee Petho, Hajnalka: *See—*
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho, Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,624,959, Cl. 514-346.000.

Vincent, Bernard, to Compagnie Industrielle de Mecanismes en abrege C.I.M. Electrically-opened latch, in particular for motor vehicle doors. 4,624,491, Cl. 292-201.000.

Vinson, Rebecca R.: *See—*
Gindrup, Wayne L.; and Vinson, Rebecca R., 4,624,798, Cl. 252-62.540.
Gindrup, Wayne L.; and Vinson, Rebecca R., 4,624,865, Cl. 427-126.200.

Vitreal Specchi S.p.A.: *See—*
Bresciani, Ferruccio; and Santambrogio, Pietro, 4,624,729, Cl. 156-345.000.

Vlahos, Petro, to Ultimatte Corporation. Comprehensive electronic compositing system. 4,625,231, Cl. 358-22.000.

Voelter, Wolfgang; and Lippert, Theodor, to Serono Pharmazeutische Praparate GmbH. Process of preparing relaxin from milk. 4,624,804, Cl. 530-366.000.

Vogelsong, Thomas L.; and Tiemann, Jerome J., to United States of America, Air Force. Parallel programmable charge domain device. 4,625,293, Cl. 364-606.000.

Volbel, Klaus-Dieter; and Trosdorff, Willi, to Tuenkers Maschinenbau GmbH. Process and device for laminating of sheet to sheet. 4,624,719, Cl. 156-60.000.

Volk, Michael; Metzger, David A.; Ostby, Donald H.; and Ostby, Robert R., to Mike Volk Co., Inc. Pneumatic shock wave generator for cleaning filter cartridges. 4,624,689, Cl. 55-269.000.

Voltaix, Incorporated: *See—*
deNeufville, John P.; Rajoria, Dalbir; and Ovshinsky, Stanford R., 4,624,902, Cl. 429-218.000.

Voltmer, Helmut; and Schwenzer, Alfred F., to New Jersey Machine Inc. Label dispenser with articulated guide. 4,624,734, Cl. 156-541.000.

von der Haar, Friedrich: *See—*
Mardorf, Robert; and von der Haar, Friedrich, 4,624,658, Cl. 604-121.000.

von Hungen, Karla J.: *See—*
Humphries, Deborah A.; and von Hungen, Karla J., 4,624,593, Cl. 400-702.000.

Vora, Madhukar B., to Fairchild Semiconductor Corporation. Method of fabricating Schottky diodes and electrical interconnections in semiconductor structures. 4,624,863, Cl. 427-84.000.

Vreeland, Jay H., to S. D. Warren Company. Method of finishing paper utilizing substrata thermal molding. 4,624,744, Cl. 162-206.000.

Vreeswijk, Franciscus W. P.; Tan, Sing L.; and van de Polder, Leendert J., to U.S. Philips Corporation. Television circuit for picture flicker correction. 4,625,239, Cl. 358-140.000.

Vreeswijk, Franciscus W. P.: *See—*
Tan, Sing L.; van de Polder, Leendert J.; De Haan, Gerard; and Vreeswijk, Franciscus W. P., 4,625,230, Cl. 358-11.000.

W. C. Bradley Company: *See—*
Hitch, Robert J., 4,624,240, Cl. 126-41.00R.

W.C. Heraeus GmbH: *See—*
Bischoff, Albrecht; Eisentraut, Holger; and Schmidt, Joachim, 4,625,228, Cl. 357-70.000.

Wacker-Chemie GmbH: *See—*
Huhn, Karl; and Kaufmann, Rudolf, 4,625,010, Cl. 528-31.000.

Wada, Fumio: *See—*
Hirahara, Takuho; Ishijima, Koji; Sano, Fumiaki; Wada, Fumio; Asami, Kazutomo; and Sugihara, Masahiro, 4,624,630, Cl. 418-63.000.

Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, to Stanley Electric Co., Ltd. Liquid crystal device with a positive display. 4,624,531, Cl. 350-340.000.

Wada, Shunichi: *See—*
Kumagai, Naotake; Tatemoto, Minoru; Oshima, Shunzou; Maruyama, Mitsunori; Wada, Shunichi; and Shimomura, Setsuhiro, 4,624,477, Cl. 280-707.000.
Ohtagaki, Shigeki; Wada, Shunichi; Hata, Yasuaki; Takizawa, Shozo; and Maruyama, Mitsunori, 4,624,478, Cl. 280-707.000.

Wafer, John A.; and Bratkowski, Walter V., to Westinghouse Electric Corp. Remotely controlled solenoid operated circuit breaker. 4,625,190, Cl. 335-20.000.

Wagner, George J.: *See—*
Wagner, Richard H.; and Wagner, George J., 4,624,600, Cl. 404-6.000.

Wagner, Gunter. Wind-driven generating plant comprising at least one blade rotating about a rotation axis. 4,624,623, Cl. 416-19.000.

Wagner, Louis E.; Flannery, Harold F.; and Rakoczynski, Randolph W., to Environmental Design, Inc. Groundwater protection system. 4,624,604, Cl. 405-128.000.

Wagner, Richard H.; and Wagner, George J. Anti-terrorist vehicle impaler. 4,624,600, Cl. 404-6.000.

Wagner Spray Tech Corporation: *See—*
Kieffer, Joseph W.; and Cyphers, Norman A., 4,624,602, Cl. 404-94.000.

Wagner, Werner: *See—*
Schoettle, Klaus; Sold, Roland; Brinkmann, Uwe; and Wagner, Werner, 4,624,423, Cl. 242-199.000.

Wahlmark, Gunnar A. Quiet hydraulic apparatus. 4,624,175, Cl. 91-487.000.

Wainio, Ronald A.: *See—*
Lazar, Lawrence W.; and Wainio, Ronald A., 4,625,189, Cl. 335-10.000.

Waitkus, Phillip A.; and Korb, Louis L., to Plastics Engineering Company. Process for preparing a vitreous carbon. 4,624,811, Cl. 264-29.500.

Waitkus, Phillip A.: *See—*
Korb, Louis L.; and Waitkus, Phillip A., 4,624,984, Cl. 524-541.000.

Wakayama, Katsuhiko; and Harada, Hiraku, to TDK Corporation. Magnetic fluid and process for preparing the same. 4,624,797, Cl. 252-62.520.

Wakeman, Russell J.: *See—*
Weber, Robert E.; Wakeman, Russell J.; and Driscoll, Barry J., 4,624,145, Cl. 73-861.310.

Walk, Johann; Studtmann, Rainer; and Haller, Fritz, to Schubert & Salzer. Process and apparatus for slipping tubes onto pegs of a transport belt. 4,624,360, Cl. 198-398.000.

Walters, Norman A.: *See—*
Sadler, David E.; and Walters, Norman A., 4,624,721, Cl. 156-92.000.

Walther, William D. Method of producing motor vehicle wheels. 4,624,038, Cl. 29-159.010.

Wan, Chung-Zong; and Dettling, Joseph C., to Engelhard Corporation. High temperature catalyst compositions for internal combustion engine. 4,624,940, Cl. 502-251.000.

Wang Laboratories, Inc.: *See—*
Snyder, Robert J., 4,625,318, Cl. 375-46.000.

Ward, Christopher R.: *See—*
Searle, Jeffrey G.; and Ward, Christopher R., 4,625,211, Cl. 342-374.000.

Wareing, James R.: *See—*
Jewell, Charles F., Jr.; and Wareing, James R., 4,625,039, Cl. 549-214.000.

Warren, Jay: *See—*
Baker, Ross G., Jr.; Calfee, Richard V.; Sanders, Richard S.; Vandegriff, Joe; and Warren, Jay, 4,624,260, Cl. 128-419.0PG.

Wassilieff, Victor, to Zeller Plastik, Koehn, Grabner & Co. Child resistant closure. 4,624,377, Cl. 215-220.000.

Watanabe, Kiyoshi: *See—*
Takahashi, Satomi; Ueda, Yasuyoshi; Shimada, Yoshio; and Watanabe, Kiyoshi, 4,625,042, Cl. 549-401.000.

Watanabe, Mitsuo; and Asaba, Takao, to Kojima, Ltd. Protected card. 4,624,875, Cl. 428-41.000.

Watanabe, Naomitsu; Tomita, Yoshifumi; Suzuki, Atsushi; and Yamamoto, Hajime, to Hitachi, Ltd. Index type color picture tube. 4,625,147, Cl. 313-468.000.

Watanabe, Shingo: *See*—
Adachi, Yoshiharu; Kozakai, Asao; Watanabe, Shingo; Nakanishi, Nobuyasu; Oka, Hiroyuki; and Nakagawa, Fumio, 4,624,508, Cl. 303-116.000.

Watanabe, Takeo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.

Watanabe, Tetsuo, to Ricoh Company, Ltd. Drive mechanism for thermal transfer type line recorder. 4,625,218, Cl. 346-76.0PH.

Watanabe, Tomoyuki, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling an electromagnetic clutch for use on a vehicle. 4,624,349, Cl. 192-0.076.

Watanabe, Yutaka; Kobayashi, Fumiyuki; Ogihara, Satoru; and Ohzawa, Yoshiyuki, to Hitachi, Ltd. Multi-layer ceramic substrate and method for the production thereof. 4,624,896, Cl. 428-428.000.

Waters, John R., to Catch the Wind Kite Shops, Inc. Aerial toy. 4,624,648, Cl. 446-176.000.

Watson, John N., to Westinghouse Electric Corp. Remote control switching of television sources. 4,625,235, Cl. 358-86.000.

Way, Denys R., to Golfing Way Limited. Golf practising devices. 4,624,461, Cl. 273-184.00B.

Weaver, Robert F., to Emhart Industries, Inc. Means for mounting a gear train and motor. 4,625,134, Cl. 310-83.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Bauml, Wolfgang; and Mosig, Ernst, 4,624,218, Cl. 122-136.00R.

Weber, Christian A.; and Paige, William P., to Dow Chemical Company, The. Low temperature impact resistant carbonate polymer blends. 4,624,986, Cl. 525-67.000.

Weber, Robert E.; Wakeman, Russell J.; and Driscoll, Barry J., to Allied Corporation. Rack and pinion reaction force sensor. 4,624,145, Cl. 73-861.310.

Wedeen, Van J.; and Rosen, Bruce R., to General Hospital Corporation, The. Flow imaging by means of nuclear magnetic resonance. 4,625,169, Cl. 324-309.000.

Weeks, Ronald D.; and Croney, David J., to International Standard Electric Corporation. Capacitors. 4,625,261, Cl. 361-433.000.

Wefel, Jerry D.: *See*—
Lobsinger, James L.; and Wefel, Jerry D., 4,625,133, Cl. 310-56.000.

Wehr Corporation: *See*—
Dick, Scott M.; and Patterson, Edward F., 4,624,567, Cl. 356-335.000.

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Schenck, Robert R.; and Weinrib, Harry P., 4,624,255, Cl. 128-334.00R.

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Ory, William F.; Staun, Paul R.; and Weir, Robert M., 4,624,117, Cl. 68-3.00R.

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Shifrin, Gordon A.; and Welner, Jerome M., 4,624,566, Cl. 356-326.000.

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Cheng, Wenche W.; Stoner, Donald R.; and Keller, Harold T., deceased, 4,624,866, Cl. 427-190.000.
Doshi, Pratap K.; and Wilson, John F., 4,624,827, Cl. 376-333.000.
Green, Richard A., 4,624,042, Cl. 29-402.080.
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Keller, Bobby R., 4,624,158, Cl. 82-12.000.
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Zimmer, John J., 4,624,400, Cl. 226-188.000.
Zuber, Pierre A.; May, Norman W.; DiSilvestro, Robert J.; and Rhoton, Richard S., 4,625,279, Cl. 364-426.000.

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DelliColli, Humbert T., 4,624,694, Cl. 71-77.000.
Klein, Edward P.; and Neider, Thomas M., 4,624,742, Cl. 162-49.000.

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Gess, Jerome M., 4,624,743, Cl. 162-164.100.

Wezel, Frank V.; and Mackness, Terry, to Hi-Tec Sports Limited. Running shoes. 4,624,061, Cl. 36-30.00A.

Wherry, Joseph L.; and Patel, Ramanlal L., to Toledo Stamping & Manufacturing Company. Rocker arm and method of making same. 4,624,223, Cl. 123-90.440.

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Martin, Dean C., 4,624,027, Cl. 15-340.000.
Ory, William F.; Staun, Paul R.; and Weir, Robert M., 4,624,117, Cl. 68-3.00R.

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White, R. Kent. Magnetic recording. 4,625,245, Cl. 360-40.000.

White, Rowland S., to Allied Corporation. Electrical junction housings. 4,624,516, Cl. 339-40.000.

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Laundon, Roy D.; Wickens, Anthony J.; and Turner, John H. W., 4,624,845, Cl. 423-633.000.

Widera, Axel; Schiessl, Alois; Hanser, Walter; Rayer, Peter; and Hieke, Klaus, to Buck Chemisch-Technische Werke GmbH & Co. Infrared radiation-emitting decoy projectile. 4,624,186, Cl. 102-336.000.

Wier, Franz, to TRW Repa GmbH. Process for the production of a belt lock for a safety belt. 4,624,035, Cl. 24-642.000.

Wilcox, Robert J., to Greening Donald Co. Ltd. Rope. 4,624,097, Cl. 57-232.000.

Wilhelm, Franz: *See*—
Kern, Otto; and Wilhelm, Franz, 4,624,960, Cl. 514-401.000.

Wilkes, Donald F., to Heinrichs, Vern, In Trust. Omnidirectional rolling support having castering induced by rotational resistance. 4,624,028, Cl. 16-18.00B.

Will, Wolfgang: *See*—
Keil, Michael; Becker, Rainer; Jahn, Dieter; Kolassa, Dieter; Schirmer, Ulrich; Will, Wolfgang; Wuerzer, Bruno; and Meyer, Norbert, 4,624,696, Cl. 71-88.000.

Williams, William J., to Rockwell International Corporation. Roller retainer for brake assembly. 4,624,348, Cl. 188-330.000.

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Williamson, Gary L.; and Williamson, Oscar A., 4,625,198, Cl. 340-514.000.

Willis, Daniel A., to Fuller Company. Two stage material cooler. 4,624,636, Cl. 432-78.000.

Willis, Donald H., to RCA Corporation. Deflection circuit with a switched mode modulator circuit. 4,625,154, Cl. 315-371.000.

Wilson, Homer M.: *See*—
Delatorre, Leroy C.; and Wilson, Homer M., 4,624,136, Cl. 73-152.000.

Wilson, John F.: *See*—
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Wilson, Robert, to Atlantic Richfield Company. Shrink-fit connector for electrical well subsurface heating processes. 4,624,484, Cl. 285-45.000.

Winchester Industries, Inc.: *See*—
Biro, Alexander J., 4,624,091, Cl. 52-656.000.

Windmere Corporation: *See*—
Kin, Lai, 4,624,271, Cl. 132-39.000.

Wing, George S., to Hi-Shear Corporation. Tension limiter for linkages. 4,624,155, Cl. 74-501.00R.

Winn, Ray. Photomask carrier and container for photomask carrier. 4,624,557, Cl. 355-75.000.

Winter, Alfred: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; and Kruschik, Klaus, 4,624,475, Cl. 280-618.000.

Winter, Heinz W.: *See*—
Haymore, Ralph B.; and Winter, Heinz W., 4,624,787, Cl. 210-531.000.

Winter, Rolf. Lightable nosing bar assembly for stairways. 4,625,266, Cl. 362-146.000.

Wisler, MacMillan M.; Birchak, James R.; and Meador, Richard A., to NL Industries, Inc. System for monitoring formation spontaneous

potential and polarization constant while drilling. 4,625,173, Cl. 324-351.000.

Witte, Hans-Hermann, to Siemens Aktiengesellschaft. Method for the recognition of the outage of one or more transmission channels in a redundantly designed optical transmission system. 4,625,314, Cl. 371-68.000.

Woffinden, Gary A.; and Petolino, Joseph A., Jr., to Amdahl Corporation. Apparatus for fast data storage with deferred error reporting. 4,625,273, Cl. 364-200.000.

Wolcott, Richard A.; Pearce, Roscoe L.; and Pauley, Charles R., to Dow Chemical Company, The. Process for the recovery of CO_2 from flue gases. 4,624,839, Cl. 423-228.000.

Wolf, Helmut: *See*—
Balzer, Wolf-Dieter; Lorenz, Klaus; Wolf, Helmut; Trieselt, Wolfgang; Stoeckigt, Dieter; and Hettiche, Albert, 4,624,803, Cl. 252-527.000.

Wollenberg, Robert H., to Chevron Research Company. Dispersant additives for lubricating oils and fuels. 4,624,681, Cl. 44-63.000.

Woltersdorf, Otto W., Jr.: *See*—
Cragoe, Edward J., Jr.; Pietruszkiewicz, Adolph M.; and Woltersdorf, Otto W., Jr., 4,625,047, Cl. 560-53.000.

Won, Vann Y. Self-propelled, rotary, liquid atomizer. 4,624,411, Cl. 239-222.190.

Wong, Alan S. Method and apparatus for enhancing CRT screen markings in a physiological display system. 4,625,278, Cl. 364-417.000.

Wong, Brian W. Adjustable occlusal plane table and method of use for orthognathic set-ups. 4,624,639, Cl. 433-56.000.

Wood, John E., III: *See*—
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Konig, Klaus; Pedain, Josef; and Woynar, Helmut, 4,625,052, Cl. 560-335.000.

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Wunsche, Peter, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Four-stroke internal combustion engine with a lubricating oil pump. 4,624,227, Cl. 123-198.00C.

Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for treating neurological disorders and aging. 4,624,852, Cl. 514-77.000.

X-Cyte Inc.: *See*—
Skeie, Halvor, 4,625,207, Cl. 342-51.000.
Skeie, Halvor; and Nysen, Paul A., 4,625,208, Cl. 342-51.000.

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Badesha, Santokh S.; Smith, Thomas W.; and Tarnawskyj, Ihor W., 4,624,701, Cl. 75-0.50A.
Brueggemann, Harry P., 4,624,528, Cl. 350-6.700.
Daniele, Joseph J., 4,624,741, Cl. 156-645.000.
Jeromin, Lothar S., 4,624,544, Cl. 355-3.00R.
Kazmaier, Peter M.; Burt, Richard A.; and Baranyi, Giuseppa, 4,624,904, Cl. 430-59.000.
Rodriguez, Paul A., 4,624,556, Cl. 355-75.000.
Solodar, Warren E., 4,624,708, Cl. 106-22.000.

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Yagi, Kenji: *See*—
Yoshida, Ichiro; Atsumi, Morihiro; Yamaguchi, Shunzo; Nakamura, Naotaka; and Yagi, Kenji, 4,625,085, Cl. 200-19.00R.

Yagihara, Morio: *See*—
Idota, Yoshio; and Yagihara, Morio, 4,624,911, Cl. 430-251.000.

Yale, Ramon L.; and Shearer, Nelson W., to GTE Products Corporation. Rare earth oxysulfide phosphors and processes for creating same. 4,624,861, Cl. 427-65.000.

Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Method of using a buffer memory device for storing a plurality of picture signals. 4,625,234, Cl. 358-78.000.

Yamada, Motokazu: *See*—
Ishikawa, Hiroshi; Matsui, Kazuma; Kurahashi, Takashi; Akatsuka, Hidehiko; and Yamada, Motokazu, 4,625,329, Cl. 382-1.000.

Yamada, Tetsuyo; Kojima, Takao; Ishiguro, Hiroyuki; and Nakayama, Yutaka, to NGK Spark Plug Co., Ltd. Air-fuel ratio sensor. 4,624,770, Cl. 204-428.000.

Yamada, Toshihiro: *See*—
Kohno, Akiomi; Hioki, Susumu; Yamada, Toshihiro; Yokoi, Kazuaki; and Yamamoto, Akihiko, 4,624,403, Cl. 228-122.000.

Yamada, Toshitaka: *See*—
Koketsu, Hisakazu; Saga, Toshihiro; Yamada, Toshitaka; Mizuno, Tiaki; and Nakase, Takamichi, 4,624,234, Cl. 123-602.000.

Yamaga, Hiroyoshi: *See*—
Niimura, Isao; Motohashi, Katsuichi; Yamaga, Hiroyoshi; and Akuzawa, Noboru, 4,624,907, Cl. 430-106.000.

Yamaguchi, Satoru; Satoh, Kozaburoh; Shimizu, Jozo; and Andoh, Haruo, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,624,883, Cl. 428-212.000.

Yamaguchi, Shunzo: *See*—
Yoshida, Ichiro; Atsumi, Morihiro; Yamaguchi, Shunzo; Nakamura, Naotaka; and Yagi, Kenji, 4,625,085, Cl. 200-19.00R.

Yamaguchi, Yoshirou: *See*—
Tsutsumi, Shuji; Yamaguchi, Yoshirou; and Kageyama, Satoru, 4,624,985, Cl. 524-803.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yoshikawa, Masaaki, 4,624,222, Cl. 123-90.270.

Yamakawa, Kiichiro; Yamamoto, Kenji; Kuraseko, Takao; Nukaga, Tadashi; and Yoshizaki, Koichi, to Sanyo Electric Co., Ltd. Washing machines. 4,624,118, Cl. 68-12.00R.

Yamamoto, Akihiko: *See*—
Kohno, Akiomi; Hioki, Susumu; Yamada, Toshihiro; Yokoi, Kazuaki; and Yamamoto, Akihiko, 4,624,403, Cl. 228-122.000.

Yamamoto, Etsuji; Matsui, Shigeru; Kuroda, Masuo; and Kohno, Hideki, to Hitachi, Ltd. NMR imaging method and apparatus. 4,625,170, Cl. 324-309.000.

Yamamoto, Hajime: *See*—
Watanabe, Naomitsu; Tomita, Yoshifumi; Suzuki, Atsushi; and Yamamoto, Hajime, 4,625,147, Cl. 313-468.000.

Yamamoto, Hiroshi: *See*—
Yamamoto, Masaichi; Araki, Seiichi; Yamamoto, Hiroshi; Yamatsu, Isao; Suzuki, Takeshi; Kajiwara, Akiharu; Suzuki, Yoshikazu; and Arai, Haruyoshi, 4,624,966, Cl. 514-724.000.

Yamamoto, Kenji: *See*—
Yamakawa, Kiichiro; Yamamoto, Kenji; Kuraseko, Takao; Nukaga, Tadashi; and Yoshizaki, Koichi, 4,624,118, Cl. 68-12.00R.

Yamamoto, Masahiko: *See*—
Nishino, Yoshinori; Yamamoto, Masahiko; Uda, Tadayoshi; Kanazawa, Tomoyoshi; and Nakagawa, Kenji, 4,624,486, Cl. 285-55.000.

Yamamoto, Masaichi; Araki, Seiichi; Yamamoto, Hiroshi; Yamatsu, Isao; Suzuki, Takeshi; Kajiwara, Akiharu; Suzuki, Yoshikazu; and Arai, Haruyoshi, to Eisai Co., Ltd. β,γ-dihydropolyprenyl alcohol derivatives and pharmaceutical composition containing a polyprenyl compound. 4,624,966, Cl. 514-724.000.

Yamamoto, Tadashi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,625,003, Cl. 526-119.000.

Yamamoto, Yoshinori: *See*—
Kawakami, Kenji; Horikawa, Norikazu; and Yamamoto, Yoshinori, 4,625,253, Cl. 360-132.000.

Yamamura, Kazuomi; Ishihara, Hideo; Iwamoto, Yoshinao; Suzuki, Shizuo; Sirasaki, Yuichi; and Asakawa, Kenichi, to Kokusai Denshin Denwa Co., Ltd. Apparatus for supplying AC current to an underwater cable. 4,625,172, Cl. 324-326.000.

Yamanaka, Akihiro; Toshikuni, Masami; and Suzuki, Kazunori, to JGC Corporation. Method for treating radioactive organic wastes. 4,624,792, Cl. 210-759.000.

Yamanis, Jean; Carlson, Emery J.; and Armor, John N., to Allied Corporation. Catalyst and method of making same for oxidation of primary amines to oximes by elemental oxygen. 4,624,939, Cl. 502-210.000.

Yamasaki, Koji: *See*—
Oda, Takashi; and Yamasaki, Koji, 4,625,212, Cl. 343-702.000.

Yamatsu, Isao: *See*—
Yamamoto, Masaichi; Araki, Seiichi; Yamamoto, Hiroshi; Yamatsu, Isao; Suzuki, Takeshi; Kajiwara, Akiharu; Suzuki, Yoshikazu; and Arai, Haruyoshi, 4,624,966, Cl. 514-724.000.

Yamauchi Rubber Industry Co., Ltd.: *See*—
Inaguma, Hideo, 4,624,723, Cl. 156-185.000.

Yamazaki, Shiro: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,624,697, Cl. 71-90.000.
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Yanagi, Masaaki: *See*—
Endo, Makoto; Ono, Satoshi; Toda, Takao; Kashiwagi, Kazuo; Yanagi, Masaaki; and Saito, Yoshihiro, 4,624,547, Cl. 355-14.00E.

Yanase, Takeyasu, to Fujitsu Limited. Magnetic-bubble memory device. 4,625,297, Cl. 365-39.000.

Yang, Chi C.; Mohr, Ralph; Hudgens, Stephen; Johncock, Annette; and Nath, Prem, to Energy Conversion Devices, Inc. Boron doped semiconductor materials and method for producing same. 4,624,862, Cl. 427-74.000.

Yano, Hiroshi, to Hokusei Nikkei Household Utensils Co., Ltd. Actuating device for the cap of a spout of a whistling kettle. 4,624,385, Cl. 220-264.000.

Yarnell, James A., to Dana Corporation. Synchronizer spring pin. 4,624,352, Cl. 192-53.00E.

Yasuda, Koichi; Nakano, Syozaburo; and Nishiyama, Noboru, to Kawasaki Steel Corporation. Overlay welding method. 4,624,406, Cl. 228-263.150.

Yasuda, Wataru; Sakamoto, Koji; Kaneko, Toshio; and Kanno, Fuchio, to Ricoh Company, Ltd. Developing device with regulated developer supply. 4,624,545, Cl. 355-3.0DD.

Yazaki Corporation: *See*—
Sakakibara, Yutaka; Ueda, Hidetaka; and Majima, Kunio, 4,625,262, Cl. 362-26.000.

Yeager, Clarke A.: *See*—
Champion, James R.; and Yeager, Clarke A., 4,625,176, Cl. 324-458.000.

Yeda Research and Development Company Limited: *See*—
Margel, Shlomo, 4,624,923, Cl. 435-176.000.

Yellin, Bernard. Barbecue grill damper-ash rake. 4,624,239, Cl. 126-25.00R.

Yim, Nelson C.: *See*—
Callahan, James F.; Moore, Michael L.; and Yim, Nelson C., 4,624,943, Cl. 514-11.000.

Yokoi, Kazuaki: *See*—
Kohno, Akiomi; Hioki, Susumu; Yamada, Toshihiro; Yokoi, Kazuaki; and Yamamoto, Akihiko, 4,624,403, Cl. 228-122.000.

Yokota, Yukinaga; Sawamoto, Yuji; Taniguchi, Hideki; and Okabe, Kazuhiko, to Kao Corporation. Production of tertiary amine. 4,625,063, Cl. 564-480.000.

Yokoyama, Shigeki: *See*—
Miyasaka, Nobuaki; Nakamura, Koki; and Yokoyama, Shigeki, 4,624,913, Cl. 430-444.000.

Yoshibumi, Minowa: *See*—
Akira, Shuhara; Kenichiro, Yamanishi; and Yoshibumi, Minowa, 4,624,859, Cl. 427-38.000.

Yoshida, Ichiro; Atsumi, Morihiro; Yamaguchi, Shunzo; Nakamura, Naotaka; and Yagi, Kenji, to Nippondenso Co., Ltd; and Toyota Jidosha Kabushiki Kaisha. Material for high frequency suppression and distributor for combustion engine composed of the same material. 4,625,085, Cl. 200-19.00R.

Yoshida Kogyo K. K.: *See*—
Ishii, Susumu; and Oda, Kiyoshi, 4,624,032, Cl. 24-429.000.
Okada, Yozo, 4,624,369, Cl. 209-626.000.
Yoshieda, Keiichi, 4,624,199, Cl. 112-113.000.

Yoshida Kogyo K.K.: *See*—
Iimura, Yoshitaka, 4,624,809, Cl. 264-23.000.

Yoshida, Motoko; Itoh, Michio; and Maeda, Kunihiro, to Hitachi, Ltd. Electrophoresis apparatus. 4,624,768, Cl. 204-299.00R.

Yoshida, Ryo: *See*—
Nagano, Eiki; Takemoto, Ichiki; Fukushima, Masayuki; Yoshida, Ryo; and Matsumoto, Hiroshi, 4,624,699, Cl. 71-92.000.

Yoshida, Yoshikazu, to Shimadzu Corporation. Time of flight mass spectrometer. 4,625,112, Cl. 250-287.000.

Yoshieda, Keiichi, to Yoshida Kogyo K. K. Apparatus for preventing fall of button parts from a chute. 4,624,199, Cl. 112-113.000.

Yoshikawa, Masaki, to Yamaha Hatsudoki Kabushiki Kaisha. Intake valve structure for internal combustion engine. 4,624,222, Cl. 123-90.270.

Yoshikubo, Seiichi: *See*—
Kobayashi, Hiroshi; Sawai, Mikio; Mieda, Junji; and Yoshikubo, Seiichi, 4,624,631, Cl. 431-9.000.

Yoshizaki, Koichi: *See*—
Yamakawa, Kiichiro; Yamamoto, Kenji; Kuraseko, Takao; Nukaga, Tadashi; and Yoshizaki, Koichi, 4,624,118, Cl. 68-12.00R.

Younes, Usama E., to Atlantic Richfield Company. Flame-retardant molded composition which incorporates a poly (styrene-CO-N-phenylmaleimide-CO-dibromostyrene copolymer. 4,625,004, Cl. 526-262.000.

Young, David A., to Exxon Chemical Patents Inc. Rhodium catalyzed hydroformylation of internal olefins. 4,625,068, Cl. 568-454.000.

Young, James R.; and Peppers, Norman A., to Savin Corporation. Method and apparatus for electrophotographically processing information. 4,624,543, Cl. 355-3.00R.

Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., to Metal Box Enterprises Inc. Process for forming oriented containers. 4,624,821, Cl. 264-532.000.

Youssefyeh, Raymond D.: *See*—
Neiss, Edward S.; Desai, Rohit M.; and Youssefyeh, Raymond D., 4,625,034, Cl. 546-152.000.

Yum, Nak I. Collapsible vertical wind mill. 4,624,624, Cl. 416-87.000.

Yuzawa, Keiji; Matsumoto, Naoaki; Kayahara, Takehiko; Tateishi, Naofumi; and Fukuda, Makoto, to Casio Computer Co., Ltd. Autoplaying apparatus. 4,624,171, Cl. 84-1.030.

Yves, Drutel; and Gerard, Joyez, to Regie Nationale des Usines Renault. Automatic control device for tying in a hay baler. 4,624,179, Cl. 100-4.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Sailer, Hubert; Ehrlinger, Friedrich J.; and Dietenberger, Josef, 4,624,353, Cl. 192-70.120.

Zanen Verstoep N.V.: *See*—
Heuvelman, Cornelis, 4,624,066, Cl. 37-65.000.

Zauderer, Bert; and Tilli, Vincent, to Coal Tech Corp. Air cooled cyclone coal combustor for optimum operation and capture of pollutants during combustion. 4,624,191, Cl. 110-264.000.

Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, to Bayer Aktiengesellschaft. Process for the production of polyamideimides from polyisocyanates, polycarboxylic acid anhydrides and lactams or polyamides in which the reaction products are precipitated with a non-solvent. 4,624,981, Cl. 524-326.000.

Zeigler, Ralph W.: *See*—
Duffy, John W.; Bonzer, William J.; Scott, Gary L.; Sickels, Dennis G.; and Zeigler, Ralph W., 4,624,442, Cl. 251-61.100.

Zeller Plastik, Koehn, Grabner & Co.: *See*—
Wassilieff, Victor, 4,624,377, Cl. 215-220.000.

Zierhut, Hermann, to Richard Hirschmann Radiotechnisches Werk. Motion detector having sensing means which determine the shape of the field of sensitivity. 4,625,113, Cl. 250-338.000.

Zijsling, Djurre H., to Shell Oil Company. Rotary drill bit with strainer element. 4,624,330, Cl. 175-393.000.

Zilkha, Uri. Adjustable security window gate. 4,624,072, Cl. 49-55.000.

Zilog, Inc.: *See*—
Tinker, Darrell E.; and Dujari, Shyam, 4,625,126, Cl. 307-262.000.

Zimmer, John J., to Westinghouse Electric Corp. Electromagnetic probe drive apparatus. 4,624,400, Cl. 226-188.000.

Zinck, Eugen. Probe for breaking and injecting soil. 4,624,194, Cl. 111-7.200.

Zink, Rudolf; and Fletcher, Ian J., to Ciba-Geigy Corporation. Bisquinazolines useful in color former systems. 4,625,027, Cl. 284-129.000.

Zip Clip, Inc.: *See*—
Franzino, Peter R., 4,624,272, Cl. 132-40.000.

Zuber, Pierre A.; May, Norman W.; DiSilvestro, Robert J.; and Rhoton, Richard S., to Westinghouse Electric Corp. Vehicle speed control apparatus and method. 4,625,279, Cl. 364-426.000.

Zuloaga, Jaime A., Jr.: *See*—
Cearley, James E.; Carruth, John C.; Dixon, Robert C.; Spencer, Stephanie S.; and Zuloaga, Jaime A., Jr., 4,624,826, Cl. 376-327.000.

Zurfluh, Rene , to Hoffmann-La Roche Inc. Carbamic acid esters. 4,625,048, Cl. 560-166.000.

Zwarts, Cornelis M. G., to Canadian Patents and Development Limited. Two-terminal negative admittance network. 4,625,186, Cl. 333-216.000.

Zweifel, Hans; Bauer, Sigrid; and Meier, Kurt, to Ciba-Geigy Corporation. Thermally transferable layers of radiation sensitive epoxy resins used to prepare protective coatings and relief images. 4,624,912, Cl. 430-258.000.

Zwolinski, Leon M.: *See*—
Dwyer, Frank J.; and Zwolinski, Leon M., 4,624,970, Cl. 521-131.000.

501 Mitsubishi Petrochemical Company, Ltd.: *See*—
Shibano, Takeshi; Sakakura, Yasuyuki; Ito, Kiichi; and Higuchi, Kazuhiko, 4,625,059, Cl. 562-600.000.

501 Oliver Rubber Company: *See*—
King, Michael J., 4,624,732, Cl. 156-394.100.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF NOVEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

BICC Limited: *See*—
Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., Re. 32,293, Cl. 350-96.230.

Braid, Milton; and Horodysky, Andrew G., to Mobil Oil Corporation. Hindered phenyl esters of cyclic borates and lubricants containing same. Re. 32,295, Cl. 252-32.70E.

Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., to BICC Limited. Overhead electric transmission systems. Re. 32,293, Cl. 350-96.230.

Fearns, Peter: *See*—
Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., Re. 32,293, Cl. 350-96.230.

Gaylard, Bernard: *See*—
Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., Re. 32,293, Cl. 350-96.230.

Gooden, Howard P. Method of texturing concrete with deep texture hammer. Re. 32,292, Cl. 125-6.000.

Horodysky, Andrew G.: *See*—
Braid, Milton; and Horodysky, Andrew G., Re. 32,295, Cl. 252-32.70E.

Ivac Corporation: *See*—
Knute, Wallace L., Re. 32,294, Cl. 604-253.000.

Knute, Wallace L., to Ivac Corporation. Drop sensing unit and associated drip chamber for IV fluid administration. Re. 32,294, Cl. 604-253.000.

Mobil Oil Corporation: *See*—
Braid, Milton; and Horodysky, Andrew G., Re. 32,295, Cl. 252-32.70E.

Murphy, Arthur B.: *See*—
Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., Re. 32,293, Cl. 350-96.230.

Pickup, Kenneth H.: *See*—
Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., Re. 32,293, Cl. 350-96.230.

Plessner, Karl W.: *See*—
Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., Re. 32,293, Cl. 350-96.230.

Wynalda Litho Inc.: *See*—
Wynalda, Robert M., Re. 32,296, Cl. 206-387.000.

Wynalda, Robert M., to Wynalda Litho Inc. Packaging system for video cassettes. Re. 32,296, Cl. 206-387.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Akzona Incorporated: *See*—
Seibert, Karl, B1 4,405,641, Cl. 514-785.000.

Arai, Atsuaki: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, B1 4,273,861, Cl. 430-382.000.

Eli Lilly and Company: *See*—
Scheifinger, Curtis C., B1 4,430,328, Cl. 514-8.000.

Fuji Photo Film Co., Ltd.: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, B1 4,273,861, Cl. 430-382.000.

Furutachi, Nobuo: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, B1 4,273,861, Cl. 430-382.000.

Groff, Gaylord L., to Minnesota Mining and Manufacturing Company. Storable crosslinkable pressure-sensitive adhesive tape. B1 4,396,675, 11-25-86, Cl. 428-355.000.

Halliburton Company: *See*—
Knox, Lloyd C.; and Sullaway, Bob L., B1 4,275,974, Cl. 405-225.000.

Hayashi, Jun: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, B1 4,273,861, Cl. 430-382.000.

Hirose, Takeshi: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, B1 4,273,861, Cl. 430-382.000.

Katsuyama, Harumi: *See*—
Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, B1 4,273,861, Cl. 430-382.000.

Knox, Lloyd C.; and Sullaway, Bob L., to Halliburton Company. Inflation and grout system. B1 4,275,974, 11-25-86, Cl. 405-225.000.

Minnesota Mining and Manufacturing Company: *See*—
Groff, Gaylord L., B1 4,396,675, Cl. 428-355.000.

Scheifinger, Curtis C., to Eli Lilly and Company. Ruminant lactation improvement. B1 4,430,328, 11-25-86, Cl. 514-8.000.

Seibert, Karl, to Akzona Incorporated. Consistency regulator for cosmetic and pharmaceutical preparations. B1 4,405,641, 11-25-86, Cl. 514-785.000.

Shiba, Keisuke; Hirose, Takeshi; Hayashi, Jun; Arai, Atsuaki; Furutachi, Nobuo; and Katsuyama, Harumi, to Fuji Photo Film Co., Ltd. Multilayer color photographic materials utilizing an interlayer correction coupler. B1 4,273,861, 11-25-86, Cl. 430-382.000.

Sullaway, Bob L.: *See*—
Knox, Lloyd C.; and Sullaway, Bob L., B1 4,275,974, Cl. 405-225.000.

LIST OF DESIGN PATENTEES

Aiyama, Fumihiko, to Kioritz Corporation. Power blower sweeper. 286,927, 11-25-86, Cl. D32-15.000.

All-Steel Inc.: *See*—
Worrell, William R., 286,916, Cl. D26-72.000.

American Commercial, Incorporated: *See*—
Blake, Alfred, 286,840, Cl. D7-13.000.
Blake, Alfred, 286,841, Cl. D7-13.000.
Blake, Alfred, 286,842, Cl. D7-13.000.

Andersen, Marlo R., to Instrumentation Laboratory. Container for reagent use in chemical clinical analysis. 286,912, 11-25-86, Cl. D24-56.000.

Anger, Wilhelm. Pair of end pieces for eyeglass temples. 286,891, 11-25-86, Cl. D16-127.000.

Anscomb, Timothy, to Schering - Prebbles Limited. Bottle. 286,856, 11-25-86, Cl. D9-301.000.

Arthur, James R., Jr., to Meadowcraft, Inc. Chair. 286,827, 11-25-86, Cl. D6-376.000.

Arthur, James R., Jr., to Meadowcraft Inc. Chair. 286,828, 11-25-86, Cl. D6-376.000.

Autote, Alexander J.: *See*—
Haas, David; and Autote, Alexander J., 286,894, Cl. D19-88.000.

Avicom International, Inc.: *See*—
Bertagna, Richard A.; and Ruiz, Rudolfo M., 286,874, Cl. D14-36.000.

Bancroft, Joseph C. Vent latch jamb. 286,913, 11-25-86, Cl. D25-74.000.

Barger, James E. Remote customer banking kiosk. 286,939, 11-25-86, Cl. D99-43.000.

Barone, Joseph: *See*—
Flockhart, James W.; and Barone, Joseph, 286,919, Cl. D28-2.000.

Barthropp, Francis M. L. Combined toy sub-machine pistol and detachable shoulder stock. 286,900, 11-25-86, Cl. D21-147.000.

Bedel, Denis E., to North American Philips Electric Corp. Air-cooled compact electric lamp. 286,914, 11-25-86, Cl. D26-3.000.

Bedel, Denis E., to North American Philips Electric Corp. Air-cooled compact electric lamp. 286,915, 11-25-86, Cl. D26-3.000.

Beidler, David B., to General Battery Corporation. Battery vent cap. 286,872, 11-25-86, Cl. D13-10.000.

Belokin, Martin P., to Martin Paul, Inc. Towel bar. 286,839, 11-25-86, Cl. D6-546.000.

Bertagna, Richard A.; and Ruiz, Rudolfo M., to Avicom International, Inc. Headset. 286,874, 11-25-86, Cl. D14-36.000.

Billings, Calvert W., Jr. Finger-nail dryer. 286,926, 11-25-86, Cl. D28-58.000.

Birks, Gary E. Curling Iron. 286,925, 11-25-86, Cl. D28-35.000.

Bitel, Vincent J., Sr., to Rogers Manufacturing Co., The. Milk case. 286,936, 11-25-86, Cl. D34-43.000.

Black, Bruce. Total ossicular replacement prosthesis. 286,909, 11-25-86, Cl. D24-33.000.

Black, Bruce. Partial ossicular replacement prosthesis. 286,910, 11-25-86, Cl. D24-33.000.

Blake, Alfred, to American Commercial, Incorporated. Cordial goblet. 286,840, 11-25-86, Cl. D7-13.000.

Blake, Alfred, to American Commercial, Incorporated. Wine goblet. 286,841, 11-25-86, Cl. D7-13.000.

Blake, Alfred, to American Commercial, Incorporated. Footed tumbler. 286,842, 11-25-86, Cl. D7-13.000.

Bode, Robert H.; and Hidden, William P., to Cambridge Wire Cloth Co., The. Sprocket for an endless conveyor belt. 286,932, 11-25-86, Cl. D34-29.000.

Bowen, Arthur W., Jr.: *See*—
Canon, David A.; Bowen, Arthur W., Jr.; and Lucarelli, James H., 286,821, Cl. D2-320.000.

Brandon, Kenneth G. Bucket. 286,929, 11-25-86, Cl. D32-53.100.

Bunyard, Kenneth L. Convertible amphibious airplane. 286,871, 11-25-86, Cl. D12-324.000.

Cahill, Tim: *See*—
Takei, Masaharu; and Cahill, Tim, 286,898, Cl. D21-63.000.

Cambridge Wire Cloth Co., The: *See*—
Bode, Robert H.; and Hidden, William P., 286,932, Cl. D34-29.000.

Cameron, Ian A., to Tytel Pty. Limited. Telephone set. 286,875, 11-25-86, Cl. D14-53.000.

Campbell, Nickie G.: *See*—
Campbell, William O.; and Campbell, Nickie G., 286,911, Cl. D24-47.000.

Campbell, William O.; and Campbell, Nickie G. Baby bottle. 286,911, 11-25-86, Cl. D24-47.000.

Canon, David A.; Bowen, Arthur W., Jr.; and Lucarelli, James H., to Goodyear Tire & Rubber Company, The. Shoe sole. 286,821, 11-25-86, Cl. D2-320.000.

Canon Kabushiki Kaisha: *See*—
Kadota, Toshihiko, 286,886, Cl. D16-31.000.

Cautereels, Victor J. J.: *See*—
Daenen, Robert H. C. M.; and Cautereels, Victor J. J., 286,844, Cl. D7-23.000.

Centennial Machine Company, Inc.: *See*—
Conner, Ronnie M.; and Harben, Grover S., Jr., 286,884, Cl. D15-139.000.

Cervero, Paul M. Console for video display unit with extendable keyboard support. 286,833, 11-25-86, Cl. D6-429.000.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Base for newspaper vending machine. 286,895, 11-25-86, Cl. D20-8.000.

Chrysler Corporation: *See*—
Dayton, William A.; Crain, John E.; and Hubbach, Robert N., 286,865, Cl. D12-91.000.

Clary Corporation: *See*—
Paul, Buddy R., 286,855, Cl. D8-389.000.

Clear Solutions, Inc.: *See*—
Wilken, Roger B., 286,834, Cl. D6-473.000.

Colby, Donald B., to Lee L. Woodard Inc. Chair frame assembly. 286,826, 11-25-86, Cl. D6-379.000.

Conklin, Gerald G. Hook unit for a golf cart. 286,931, 11-25-86, Cl. D34-27.000.

Conner, Ronnie M.; and Harben, Grover S., Jr., to Centennial Machine Company, Inc. Unloader attachment for a poultry processing machine. 286,884, 11-25-86, Cl. D15-139.000.

Corporation d'Emballage Universel: *See*—
Povitz, Fred J., 286,938, Cl. D99-34.000.

Crain, John E.: *See*—
Dayton, William A.; Crain, John E.; and Hubbach, Robert N., 286,865, Cl. D12-91.000.

Daenen, Robert H. C. M.; and Cautereels, Victor J. J., to Dart Industries Inc. Bowl. 286,844, 11-25-86, Cl. D7-23.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and Cautereels, Victor J. J., 286,844, Cl. D7-23.000.

Dayton, William A.; Crain, John E.; and Hubbach, Robert N., to Chrysler Corporation. Automobile body. 286,865, 11-25-86, Cl. D12-91.000.

Delta Buildings Products Limited: *See*—
Gibbs, Andrew R., 286,906, Cl. D23-17.000.

DiFede, John. Combined pour spout and air bleeder for fluid container and the like. 286,860, 11-25-86, Cl. D9-435.000.

Ditmanson, Robert C. Motorized abrasive cue tip shaper. 286,852, 11-25-86, Cl. D8-90.000.

E & B Giftware: *See*—
Hollinger, Fred; and Ross, Paul, 286,861, Cl. D10-62.000.

Ensar Corporation: *See*—
Sarnoff, Norton; and Fletcher, Carl R., 286,849, Cl. D7-409.000.

Envall, Bjorn E. A.; and Ohlsson, Dick O., to Saab-Scania Aktiebolag. Outer wheel housing for an automobile. 286,867, 11-25-86, Cl. D12-184.000.

Envall, Bjorn E. A.; and Ohlsson, Dick O., to Saab-Scania Aktiebolag. Inner wheel housing for an automobile. 286,868, 11-25-86, Cl. D12-184.000.

Etablissements Regnault: *See*—
Regnault, Pierre, 286,893, Cl. D19-51.000.

Fairchild, Richard. Boat hull. 286,870, 11-25-86, Cl. D12-302.000.

Fane, William J.; and Genest, Leonard J. Key for door locks. 286,854, 11-25-86, Cl. D8-347.000.

Fitzwater, Edwin, to Regina Co., Inc., The. Shampoo cartridge for carpet cleaner. 286,928, 11-25-86, Cl. D32-25.000.

Fletcher, Carl R.: *See*—
Sarnoff, Norton; and Fletcher, Carl R., 286,849, Cl. D7-409.000.

Flockhart, James W.; and Barone, Joseph, to USV Pharmaceutical Corp. Pharmaceutical tablet. 286,919, 11-25-86, Cl. D28-2.000.

Florescence, Inc.: *See*—
Stern, Jon L.; Linton, Thomas N.; and Rosen, Paul S. (said Paul S. Rosen assors. to), 286,830, Cl. D6-405.000.

Fritz Schafer Gesellschaft mit beschrankter Haftung: *See*—
Schafer, Gerhard, 286,937, Cl. D34-43.000.

General Battery Corporation: *See*—
Beidler, David B., 286,872, Cl. D13-10.000.

General Electric Company: *See*—
Smith, Leroy H., Jr.; Hauser, Ambrose A.; Ruehr, William C.; Stuart, Alan R.; and Wright, Jack D., 286,880, Cl. D15-1.000.

Genest, Leonard J.: *See*—
Fane, William J.; and Genest, Leonard J., 286,854, Cl. D8-347.000.

Georg Fischer Aktiengesellschaft: *See*—
Hilpert, Bruno; and Hunziker, Bruno, 286,907, Cl. D23-19.000.

Gibbs, Andrew R., to Delta Buildings Products Limited. Sprayer. 286,906, 11-25-86, Cl. D23-17.000.

Ginouves, Valeska. Table. 286,836, 11-25-86, Cl. D6-484.000.

Giorgio, Pomodoro, to Hanorah Italiana. Bottle for perfumes. 286,858, 11-25-86, Cl. D9-370.000.

Gold Star Company, Limited: *See*—
Hong, Jung P., 286,882, Cl. D15-81.000.

Goodyear Tire & Rubber Company, The: *See*—
Canon, David A.; Bowen, Arthur W., Jr.; and Lucarelli, James H., 286,821, Cl. D2-320.000.

Haas, David; and Autote, Alexander J., to Temtec Inc. Combined writing board and pen. 286,894, 11-25-86, Cl. D19-88.000.

Hamilton Beach Inc.: *See*—
Levin, Monte L., 286,848, Cl. D7-309.000.

Hanorah Italiana: *See*—
Giorgio, Pomodoro, 286,858, Cl. D9-370.000.

Hara, Kunio: *See*—
Okuyama, Tooru; and Hara, Kunio, 286,885, Cl. D16-31.000.

Harben, Grover S., Jr.: *See*—
Conner, Ronnie M.; and Harben, Grover S., Jr., 286,884, Cl. D15-139.000.

Hashimoto, Masanori; Imai, Akira; and Serbinski, Andrew T., to Ricoh Company, Ltd. Electrophotographic copying machine. 286,888, 11-25-86, Cl. D16-31.000.

Hashimoto, Masanori; and Imai, Akira, to Ricoh Company, Ltd. Electrophotographic copying machine. 286,890, 11-25-86, Cl. D16-31.000.
Hauser, Ambrose A.: *See*—
Smith, Leroy H., Jr.; Hauser, Ambrose A.; Ruehr, William C.; Stuart, Alan R.; and Wright, Jack D., 286,880, Cl. D15-1.000.
Hedlund, Raymond J., to Kelsey-Hayes Company. Vehicle wheel center. 286,869, 11-25-86, Cl. D12-211.000.
Herbert, Walter N. Holder for playing cards. 286,897, 11-25-86, Cl. D21-54.000.
Hidden, William P.: *See*—
Bode, Robert H.; and Hidden, William P., 286,932, Cl. D34-29.000.
Hilpert, Bruno; and Hunziker, Bruno, to Georg Fischer Aktiengesellschaft. Hydraulic or pneumatic actuator unit for valves. 286,907, 11-25-86, Cl. D23-19.000.
Hollinger, Fred; and Ross, Paul, to E & B Giftware. Combined level and measuring device. 286,861, 11-25-86, Cl. D10-62.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Makita, Akio; Kawaguchi, Yukinori; and Watanabe, Akira, 286,866, Cl. D12-107.000.
Hong, Jung P., to Gold Star Company, Limited. Combined refrigerator and microwave oven. 286,882, 11-25-86, Cl. D15-81.000.
Hubbach, Robert N.: *See*—
Dayton, William A.; Crain, John E.; and Hubbach, Robert N., 286,865, Cl. D12-91.000.
Hung, Michael. Jack. 286,934, 11-25-86, Cl. D34-31.000.
Hunziker, Bruno: *See*—
Hilpert, Bruno; and Hunziker, Bruno, 286,907, Cl. D23-19.000.
Icaro Olivieri & C. S.p.A.: *See*—
Olivieri, Oliviero, 286,903, Cl. D21-225.000.
Ikeda, Tameaki, to Sony Corporation. Non-electronic sound amplifier headset or the like. 286,873, 11-25-86, Cl. D14-36.000.
Imai, Akira: *See*—
Hashimoto, Masanori; Imai, Akira; and Serbinski, Andrew T., 286,888, Cl. D16-31.000.
Hashimoto, Masanori; and Imai, Akira, 286,890, Cl. D16-31.000.
Innovative Time Corporation: *See*—
Marsh, Charlotte, 286,835, Cl. D6-474.000.
Instrumentation Laboratory: *See*—
Andersen, Marlo R., 286,912, Cl. D24-56.000.
Johnson, Conrad E. Pattern glass cutter. 286,853, 11-25-86, Cl. D8-98.000.
Jones, Lera M. Combined restaurant condiment, candle holder and accessory stand. 286,845, 11-25-86, Cl. D7-52.000.
K-Jack Engineering Company, Inc.: *See*—
Chalabian, Jack S., 286,895, Cl. D20-8.000.
Kabushiki Kaisha Toshiba: *See*—
Okuyama, Tooru; and Hara, Kunio, 286,885, Cl. D16-31.000.
Kadota, Toshihiko, to Canon Kabushiki Kaisha. Electrophotographic copier. 286,886, 11-25-86, Cl. D16-31.000.
Katzler, Fritzie M.: *See*—
Katzler, Peter A.; and Katzler, Fritzie M., 286,838, Cl. D6-524.000.
Katzler, Peter A.; and Katzler, Fritzie M. Adjustable shower head holder. 286,838, 11-25-86, Cl. D6-524.000.
Kawaguchi, Yukinori: *See*—
Makita, Akio; Kawaguchi, Yukinori; and Watanabe, Akira, 286,866, Cl. D12-107.000.
Kelsey-Hayes Company: *See*—
Hedlund, Raymond J., 286,869, Cl. D12-211.000.
Kim, Young G. Aquatic exercise device. 286,904, 11-25-86, Cl. D21-238.000.
Kioritz Corporation: *See*—
Aiyama, Fumihiko, 286,927, Cl. D32-15.000.
Kojima, Fumiyo, to Ricoh Company, Ltd. Facsimile recorder and transceiver. 286,878, 11-25-86, Cl. D14-94.000.
Korneski, Michael. Swimming fin. 286,905, 11-25-86, Cl. D21-239.000.
Kubicki, Philip; and Richardson, Geoffrey. Guitar head. 286,892, 11-25-86, Cl. D17-20.000.
Lanzdorf, Daniel J.; and Pollock, Richard C., to Oshkosh Truck Corporation. Emergency vehicle. 286,864, 11-25-86, Cl. D12-13.000.
Lectrum Pty. Ltd.: *See*—
Matyear, John, 286,831, Cl. D6-419.000.
Lee, Freddy T. Golf trophy. 286,863, 11-25-86, Cl. D11-160.000.
Lee L. Woodard Inc.: *See*—
Colby, Donald B., 286,826, Cl. D6-379.000.
Levin, Monte L., to Hamilton Beach Inc. Electric hot beverage maker. 286,848, 11-25-86, Cl. D7-309.000.
Lintou, Thomas N.: *See*—
Stern, Jon L.; Linton, Thomas N.; and Rosen, Paul S., 286,830, Cl. D6-405.000.
Lu, Wan C. Sports shoe. 286,820, 11-25-86, Cl. D2-310.000.
Lucarelli, James H.: *See*—
Canon, David A.; Bowen, Arthur W., Jr.; and Lucarelli, James H., 286,821, Cl. D2-320.000.
Lymburner, Kenneth G. Lever for portable wrench support. 286,933, 11-25-86, Cl. D34-31.000.
Lynch, Howard L. Oil-level checking aide for vehicles. 286,881, 11-25-86, Cl. D15-5.000.
Mahan, John A.: *See*—
Nogas, David A.; and Mahan, John A., 286,876, Cl. D14-53.000.
Makita, Akio; Kawaguchi, Yukinori; and Watanabe, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Four wheeled motorcycle. 286,866, 11-25-86, Cl. D12-107.000.
Marsh, Charlotte, to Innovative Time Corporation. Watch display stand. 286,835, 11-25-86, Cl. D6-474.000.
Martin Paul, Inc.: *See*—
Belokin, Martin P., 286,839, Cl. D6-546.000.
Matthews, Stephen N.; Milner, Alan D.; and Milner, David G. Combined computer work station and storage unit. 286,832, 11-25-86, Cl. D6-425.000.
Matyear, John, to Lectrum Pty. Ltd. Lectern. 286,831, 11-25-86, Cl. D6-419.000.
McBee, William D. Trash compactor. 286,883, 11-25-86, Cl. D15-123.000.
Meadowcraft, Inc.: *See*—
Arthur, James R., Jr., 286,827, Cl. D6-376.000.
Arthur, James R., Jr., 286,828, Cl. D6-376.000.
Milner, Alan D.: *See*—
Matthews, Stephen N.; Milner, Alan D.; and Milner, David G., 286,832, Cl. D6-425.000.
Milner, David G.: *See*—
Matthews, Stephen N.; Milner, Alan D.; and Milner, David G., 286,832, Cl. D6-425.000.
Mitel Corporation: *See*—
Nogas, David A.; and Mahan, John A., 286,876, Cl. D14-53.000.
Miura, Akifumi, to Tomy Kogyo Co., Inc. Toy trackway. 286,899, 11-25-86, Cl. D21-143.000.
Mizuno, Shigeo; and Takahashi, Masaki, to Nishiyama Corporation of America. Ventilator for containers. 286,908, 11-25-86, Cl. D23-139.000.
Muller, Ronald L., to North American Philips Corporation. Hair dryer. 286,924, 11-25-86, Cl. D28-13.000.
Murukurthy, Rao K. Container for liquids. 286,857, 11-25-86, Cl. D9-352.000.
Nathan, Walter, to RTC Industries, Inc. Magazine vending tray. 286,837, 11-25-86, Cl. D6-510.000.
Nishiyama Corporation of America: *See*—
Mizuno, Shigeo; and Takahashi, Masaki, 286,908, Cl. D23-139.000.
Nogas, David A.; and Mahan, John A., to Mitel Corporation; and Trillium Telephone Systems Inc. Telephone. 286,876, 11-25-86, Cl. D14-53.000.
North American Philips Corporation: *See*—
Muller, Ronald L., 286,924, Cl. D28-13.000.
Tsuji, Masao, 286,923, Cl. D28-13.000.
North American Philips Electric Corp.: *See*—
Bedel, Denis E., 286,914, Cl. D26-3.000.
Bedel, Denis E., 286,915, Cl. D26-3.000.
Ohlsson, Dick O.: *See*—
Envall, Bjorn E. A.; and Ohlsson, Dick O., 286,867, Cl. D12-184.000.
Envall, Bjorn E. A.; and Ohlsson, Dick O., 286,868, Cl. D12-184.000.
Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable dinosaurian toy. 286,901, 11-25-86, Cl. D21-148.000.
Okuda, Yasuhiro: *See*—
Serbinski, Andrew T.; and Okuda, Yasuhiro, 286,887, Cl. D16-31.000.
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Oshkosh Truck Corporation: *See*—
Lanzdorf, Daniel J.; and Pollock, Richard C., 286,864, Cl. D12-13.000.
Paul, Buddy R., to Clary Corporation. Connector plate for trusses or the like. 286,855, 11-25-86, Cl. D8-389.000.
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Suzuki, Toshikazu, 286,851, Cl. D8-50.000.
Pollock, Richard C.: *See*—
Lanzdorf, Daniel J.; and Pollock, Richard C., 286,864, Cl. D12-13.000.
Povitz, Fred J., to Corporation d'Emballage Universel. Coin display case. 286,938, 11-25-86, Cl. D99-34.000.
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Priam Corporation: *See*—
Viskochil, Stephen R., 286,879, Cl. D14-109.000.
Racal Acoustics Limited: *See*—
Powell, David, 286,877, Cl. D14-64.000.
Regina Co., Inc., The: *See*—
Fitzwater, Edwin, 286,928, Cl. D32-25.000.
Regnault, Pierre, to Etablissements Regnault. Writing instrument. 286,893, 11-25-86, Cl. D19-51.000.
Revlon, Inc.: *See*—
Yeranossian, Karl, 286,829, Cl. D6-396.000.
Richardson, Geoffrey: *See*—
Kubicki, Philip; and Richardson, Geoffrey, 286,892, Cl. D17-20.000.
Ricoh Company, Ltd.: *See*—
Hashimoto, Masanori; Imai, Akira; and Serbinski, Andrew T., 286,888, Cl. D16-31.000.
Hashimoto, Masanori; and Imai, Akira, 286,890, Cl. D16-31.000.
Kojima, Fumiyo, 286,878, Cl. D14-94.000.
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Umino, Toshio; and Serbinski, Andrew T., 286,889, Cl. D16-31.000.
Rogers Manufacturing Co., The: *See*—
Bitel, Vincent J., Sr., 286,936, Cl. D34-43.000.

Rosen, Paul S.: *See*—
Stern, Jon L.; Linton, Thomas N.; and Rosen, Paul S., 286,830, Cl. D6-405.000.
Roser, Dawn C. Child's rocking chair. 286,823, 11-25-86, Cl. D6-345.000.
Ross, Paul: *See*—
Hollinger, Fred; and Ross, Paul, 286,861, Cl. D10-62.000.
Rotpunkt Anso Zimmerman: *See*—
Zimmerman, Anso, 286,846, Cl. D7-77.000.
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Rougier, Roger. Chair. 286,825, 11-25-86, Cl. D6-363.000.
RTC Industries, Inc.: *See*—
Nathan, Walter, 286,837, Cl. D6-510.000.
Ruehr, William C.: *See*—
Smith, Leroy H., Jr.; Hauser, Ambrose A.; Ruehr, William C.; Stuart, Alan R.; and Wright, Jack D., 286,880, Cl. D15-1.000.
Ruiz, Rudolfo M.: *See*—
Bertagna, Richard A.; and Ruiz, Rudolfo M., 286,874, Cl. D14-36.000.
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Envall, Bjorn E. A.; and Ohlsson, Dick O., 286,867, Cl. D12-184.000.
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Serbinski, Andrew T.: *See*—
Hashimoto, Masanori; Imai, Akira; and Serbinski, Andrew T., 286,888, Cl. D16-31.000.
Umino, Toshio; and Serbinski, Andrew T., 286,889, Cl. D16-31.000.
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Sony Corporation: *See*—
Ikeda, Tameaki, 286,873, Cl. D14-36.000.
Stern, Jon L.; Linton, Thomas N.; and Rosen, Paul S., to Florescence, Inc., by said Paul S. Rosen. Flower display stand. 286,830, 11-25-86, Cl. D6-405.000.
Stuart, Alan R.: *See*—
Smith, Leroy H., Jr.; Hauser, Ambrose A.; Ruehr, William C.; Stuart, Alan R.; and Wright, Jack D., 286,880, Cl. D15-1.000.
Suzuki, Toshikazu, to Plus Corporation. Stapler. 286,851, 11-25-86, Cl. D8-50.000.
Syracuse China Corporation: *See*—
Shoreman, Helen Z., 286,843, Cl. D7-23.000.
Takahashi, Masaki: *See*—
Mizuno, Shigeo; and Takahashi, Masaki, 286,908, Cl. D23-139.000.
Takara Co., Ltd.: *See*—
Ohno, Kouzin, 286,901, Cl. D21-148.000.
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Takigawa, Koichi, 286,920, Cl. D28-9.000.
Takigawa, Koichi, 286,921, Cl. D28-9.000.
Takigawa, Koichi, 286,922, Cl. D28-9.000.
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Hass, David; and Autote, Alexander J., 286,894, Cl. D19-88.000.
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Tilley, Gordon J. Racket. 286,902, 11-25-86, Cl. D21-212.000.
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Makita, Akio; Kawaguchi, Yukinori; and Watanabe, Akira, 286,866, Cl. D12-107.000.
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Smith, Leroy H., Jr.; Hauser, Ambrose A.; Ruehr, William C.; Stuart, Alan R.; and Wright, Jack D., 286,880, Cl. D15-1.000.
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Ducloux, Yves: *See*—
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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

22 4,624,015
161 A 4,624,016

CLASS 4

304 4,624,017
325 4,624,018
366 4,624,019
651 4,624,020

CLASS 5

431 4,624,021
508 4,624,022

CLASS 8

115.56 4,624,676
115.6 4,624,675
151 4,624,023
490 4,624,677
526 4,624,678
650 4,624,679

CLASS 10

86 A 4,624,024

CLASS 15

41 R 4,624,025
340 4,624,026
4,624,027

CLASS 16

18 B 4,624,028

CLASS 17

1 R 4,624,029
33 4,624,030
64 4,624,031

CLASS 24

429 4,624,032
633 4,624,033
641 4,624,034
642 4,624,035

CLASS 26

51.4 4,624,036

CLASS 29

25.42 4,624,037
159.01 4,624,038
257 4,624,039
258 4,624,040
263 4,624,041
402.08 4,624,042
568 4,624,043
4,624,044
572 4,624,045
576 B 4,624,046
576 W 4,624,047
603 4,624,048
622 4,624,049
740 4,624,050

CLASS 30

50 4,624,051
97 4,624,052
166 R 4,624,053
374 4,624,054

CLASS 33

126.5 4,624,055
180 R 4,624,056
570 4,624,057

CLASS 34

10 4,624,058
20 4,624,059

CLASS 36

1 4,624,060
30 A 4,624,061
114 4,624,062
117 4,624,063
119 4,624,064
120 4,624,065

CLASS 37

65 4,624,066

CLASS 40

152.1 4,624,067

CLASS 43

6 4,624,068
21.2 4,624,069
132.1 4,624,070

CLASS 44

51 4,624,680
63 4,624,681
71 4,624,682

CLASS 47

1.5 4,624,071

CLASS 48

69 4,624,683
197 R 4,624,684

CLASS 49

55 4,624,072
161 4,624,073
192 4,624,075
199 4,624,076
222 4,624,074
432 4,624,077

CLASS 51

98.5 4,624,081
170 MT 4,624,078
214 4,624,079
410 4,624,080

CLASS 52

11 4,624,082
65 4,624,083
173 R 4,624,084
204 4,624,085
220 4,624,086
254 4,624,087
410 4,624,089
484 4,624,088
648 4,624,090
656 4,624,091
713 4,624,092
716 4,624,093
786 4,624,094

CLASS 53

117 4,624,095
209 4,624,096
314 4,624,098
425 4,624,101
432 4,624,099
550 4,624,100

CLASS 55

13 4,624,685
196 4,624,686
206 4,624,687
238 4,624,688
269 4,624,689
385 R 4,624,690
396 4,624,691

CLASS 57

232 4,624,097
296 4,624,102
348 4,624,103

CLASS 60

39.75 4,624,104
361 4,624,105
452 4,624,106
547.1 4,624,107
550 4,624,108
648 4,624,109
670 4,624,110
694 4,624,111

CLASS 62

149 4,624,112
467 4,624,113
502 4,624,114

CLASS 65

1 4,624,692
4,624,693

CLASS 66

172 R 4,624,115
193 4,624,116

CLASS 68

3 R 4,624,117
12 R 4,624,118

CLASS 70

366 4,624,119
380 4,624,120

CLASS 71

77 4,624,694
86 4,624,695
88 4,624,696
90 4,624,697
4,624,698
92 4,624,699

CLASS 72

65 4,624,121
70 4,624,122
110 4,624,123
403 4,624,124
453.13 4,624,125
453.14 4,624,126

CLASS 73

1 DV 4,624,127
19 4,624,128
32 A 4,624,129
40.7 4,624,130
46 4,624,131
55 4,624,132
61.1 R 4,624,133
118.2 4,624,134
119 A 4,624,135
152 4,624,136
204 4,624,137
4,624,138
304 C 4,624,139
4,624,140
597 4,624,142
620 4,624,143
834 4,624,144
861.31 4,624,145
861.66 4,624,146
864.15 4,624,147
864.21 4,624,148
864.52 4,624,149
864.81 4,624,150
865.8 4,624,141

CLASS 74

491 4,624,151
501 R 4,624,155
518 4,624,152
595 4,624,156
689 4,624,153
695 4,624,154

CLASS 75

0.5 A 4,624,701
0.5 BB 4,624,700
93 R 4,624,702
101 BE 4,624,704
101 R 4,624,703
239 4,624,705
246 4,624,706
257 4,624,707

CLASS 76

86 4,624,157

CLASS 82

12 4,624,158
19 4,624,159

CLASS 83

13 4,624,160
47 4,624,161
74 4,624,162
411 R 4,624,163
542 4,624,164
685 4,624,165
699 4,624,166
802 4,624,167
862 4,624,168
881 4,624,169

CLASS 84

1.03 4,624,170
4,624,171
1.15 4,624,172

CLASS 89

8 4,624,173

CLASS 91

485 4,624,174
487 4,624,175

CLASS 98

119 4,624,176

CLASS 99

286 4,624,177
337 4,624,178

CLASS 100

4 4,624,179
41 4,624,180

CLASS 101

4 4,624,181
147 4,624,182
365 4,624,183
375 4,624,184

CLASS 102

293 4,624,185
336 4,624,186
520 4,624,187

CLASS 105

355 4,624,188
451 4,624,189

CLASS 106

22 4,624,708
4,624,709
290 4,624,710
308 S 4,624,711

CLASS 110

215 4,624,190
264 4,624,191
344 4,624,192

CLASS 111

6 4,624,193
7.2 4,624,194
12 4,624,195
52 4,624,196
4,624,197

CLASS 112

10 4,624,198
113 4,624,199
121.12 4,624,200
168 4,624,201
313 4,624,202

CLASS 114

39 4,624,203
91 4,624,204
103 4,624,205
146 4,624,206
315 4,624,207
345 4,624,208
354 4,624,209

CLASS 116

63 P 4,624,210
209 4,624,211

CLASS 118

19 4,624,212
300 4,624,213
719 4,624,214

CLASS 119

51 R 4,624,215

CLASS 122

17 4,624,216
32 4,624,217
136 R 4,624,218
170 4,624,219
379 4,624,220

CLASS 123

41.08 4,624,221
90.27 4,624,222
90.44 4,624,223
90.46 4,624,224
90.58 4,624,225
179 H 4,624,226
198 C 4,624,227
378 4,624,228
425 4,624,229
445 4,624,230
450 4,624,231
489 4,624,232
506 4,624,233
602 4,624,234

CLASS 125

6 Re.32,292
11 R 4,624,236
15 4,624,237

CLASS 126

9 R 4,624,238
25 R 4,624,239
41 R 4,624,240
92 B 4,624,241
427 4,624,242

CLASS 128

6 4,624,243
24 R 4,624,244
75 4,624,245
80 C 4,624,246
4,624,247
89 R 4,624,248
92 H 4,624,250
92 ZK 4,624,249
200.14 4,624,251
305.3 4,624,252
314 4,624,253
325 4,624,254
334 C 4,624,257
334 R 4,624,255
335.5 4,624,256
341 4,624,258
396 4,624,259
419 PG 4,624,260
635 4,624,261
652 4,624,235
689 4,624,262
710 4,624,263
736 4,624,264
784 4,624,265
785 4,624,266

CLASS 131

108 4,624,267
332 4,624,268
352 4,624,269

CLASS 132

39 4,624,270
4,624,271
40 4,624,272
88.7 4,624,273

CLASS 134

8 4,624,712
25.2 4,624,713
111 4,624,274

CLASS 135

19.5 4,624,275
20 R 4,624,276

CLASS 136

249 4,625,070
250 4,625,071

CLASS 137

116.3 4,624,277
172 4,624,278
218 4,624,279
392 4,624,280
599.2 4,624,281
4,624,282
625.24 4,624,283
625.62 4,624,284
625.65 4,624,285
859 4,624,286

CLASS 139

134 4,624,287
449 4,624,288

CLASS 140

105 4,624,289

CLASS 141

1 4,624,290
4,624,291
5 4,624,292

CLASS 144

2 Z 4,624,293
253 F 4,624,294
347 4,624,295

CLASS 148

3 4,624,714
6.14 R 4,624,715
12.7 A 4,624,717
12.7 N 4,624,716

CLASS 152

209 R 4,624,296

CLASS 156

56 4,624,718
60 4,624,719
86 4,624,720
92 4,624,721
156 4,624,722
185 4,624,723
264 4,624,724
310 4,624,725
323 4,624,726
331.8 4,624,727
345 4,624,728
4,624,729
358 4,624,730
382 4,624,731
394.1 4,624,732
541 4,624,733
4,624,734
610 4,624,735
643 4,624,736
4,624,737
4,624,738
4,624,739
4,624,740
645 4,624,741

CLASS 162

49 4,624,742
164.1 4,624,743
206 4,624,744
252 4,624,745

CLASS 164

262 4,624,297
486 4,624,298

CLASS 165

1 4,624,299
45 4,624,300
47 4,624,301
80.2 4,624,302
4,624,303
162 4,624,304
165 4,624,305

CLASS 166

53 4,624,306
55.3 4,624,307
65.1 4,624,308
66 4,624,309
106 4,624,310
125 4,624,311
155 4,624,312
241 4,624,313
271 4,624,314
323 4,624,315
325 4,624,316
334 4,624,317
359 4,624,318
369 4,624,319

CLASS 169

50 4,624,320

CLASS 172

15 4,624,321
620 4,624,322

CLASS 173

90 4,624,323
93 4,624,324
139 4,624,325

CLASS 174

35 R 4,625,072
72 R 4,625,073
117 F 4,625,074

CLASS 175

67 4,624,326
4,624,327
78 4,624,328
374 4,624,329
393 4,624,330

CLASS 177

185 4,624,331

224 4,624,332

CLASS 178

18 4,625,075
22.11 4,625,076

CLASS 180

6.48 4,624,333
79.1 4,624,334
142 4,624,335
4,624,336

CLASS 181

145 4,624,337
148 4,624,338
230 4,624,339

CLASS 182

2 4,624,340
15 4,624,341
223 4,624,342

CLASS 187

29 R 4,624,343

CLASS 188

73.36 4,624,344
196 M 4,624,345
282 4,624,346
322.15 4,624,347
330 4,624,348

CLASS 192

0.076 4,624,349
4 C 4,624,350
48.5 4,624,351
53 E 4,624,352
70.12 4,624,353
84 C 4,624,354
85 AA 4,624,355
85 CA 4,624,356

CLASS 198

313 4,624,357
345 4,624,358
366 4,624,359
398 4,624,360
463.5 4,624,361
735 4,624,362

CLASS 200

11 DA 4,625,084
19 R 4,625,085

CLASS 203

3 4,624,746
11 4,624,747
29 4,624,748

CLASS 204

15 4,624,749
26 4,624,750
28 4,624,751
37.6 4,624,752
58.5 4,624,753
4,624,754
4,624,755
59 R 4,624,756
78 4,624,757
4,624,758
4,624,759
141.5 4,624,760
181.7 4,624,762
188 4,624,763
4,624,764
4,624,765
294 4,624,766
298 4,624,767
299 R 4,624,768
301 4,624,769
428 4,624,770

CLASS 206

150 4,624,363
328 4,624,364
387 Re.32,296
554 4,624,365
620 4,624,366

CLASS 208

74 4,624,771
95 4,624,772
120 4,624,773
4,624,774
131 4,624,775
302 4,624,776

CLASS 209

170 4,624,777
577 4,624,367
581 4,624,368
626 4,624,369
631 4,624,370

CLASS 210

180 4,624,779
193.1 4,624,780
220 4,624,781
268 4,624,782
271 4,624,783
321.1 4,624,784
321.3 4,624,778
414 4,624,785
4,624,786
531 4,624,787
607 4,624,788
661 4,624,789
665 4,624,790
704 4,624,791
759 4,624,792

CLASS 211

4 4,624,371
4,624,372
41 4,624,373
60.1 4,624,374
170 4,624,375
187 4,624,376

CLASS 215

220 4,624,377
230 4,624,378

CLASS 219

10.55 A 4,625,088
10.55 B 4,625,086
10.55 F 4,625,087
10.55 R 4,625,089
10.57 4,625,090
86.24 4,625,091
121 LJ 4,625,093
121 PM 4,625,092
4,625,094
137 WM 4,625,095
331 4,625,096
441 4,625,097
462 4,625,098

CLASS 220

4 R 4,624,379
6 4,624,380
7 4,624,381
8 4,624,382
23.4 4,624,383
212 4,624,384
264 4,624,385
269 4,624,386
273 4,624,387
435 4,624,388

CLASS 222

1 4,624,389
3 4,624,390
53 4,624,391
83 4,624,392
83.5 4,624,393
103 4,624,394
129.1 4,624,395

CLASS 223

92 4,624,396

CLASS 224

42.45 R 4,624,397

CLASS 225

21 4,624,398

CLASS 226

181 4,624,399
188 4,624,400

CLASS 227

125 4,624,401

CLASS 228

119 4,624,402
122 4,624,403
198 4,624,404
212 4,624,405
263.15 4,624,406

CLASS 229

1.5 R 4,624,407
69 4,624,408

CLASS 235

88 RC 4,625,099
458 4,625,100
462 4,625,101
492 4,625,102

CLASS 239

11 4,624,409
83 4,624,410
222.19 4,624,411
232 4,624,412
333 4,624,413
467 4,624,414
590.3 4,624,415

CLASS 241

1 4,624,416
17 4,624,417
46.17 4,624,418
101 B 4,624,419
298 4,624,420

CLASS 242

77 4,624,421
107.2 4,624,422
199 4,624,423

CLASS 244

3.21 4,624,424
13 4,624,425
135 R 4,624,426
152 4,624,427

CLASS 246

276 4,624,428

CLASS 248

56 4,624,429
211 4,624,430
215 4,624,431
316.5 4,624,432
346 4,624,433
454 4,624,434
550 4,624,435
555 4,624,436
564 4,624,437
642 4,624,438

CLASS 249

48 4,624,439
194 4,624,440

CLASS 250

201 4,625,103
202 4,625,104
205 4,625,105
213 VT 4,625,106
223 B 4,625,107
227 4,625,108
231 SE 4,625,109
269 4,625,110
270 4,625,111
287 4,625,112
338 4,625,113
341 4,625,114
353 4,625,115
363 S 4,625,116
385 4,625,117
432 PD 4,625,118
455.1 4,625,119
492.1 4,625,120
492.2 4,625,121
506.1 4,625,122

CLASS 251

30.01 4,624,441
61.1 4,624,442
63.4 4,624,445
65 4,624,443
121 4,624,444

CLASS 252

8.553 4,624,795
8.6 4,624,793
8.8 4,624,794
32.7 E Re.32,295
62.52 4,624,797
62.54 4,624,798
62.9 4,624,796
301.17 4,624,799
313.2 4,624,800
500 4,624,801
522 R 4,624,802
527 4,624,803

CLASS 254

88 4,624,446
93 H 4,624,447
122 4,624,448
231 4,624,449
273 4,624,450

CLASS 261

91 4,624,806

CLASS 264

12 4,624,807
23 4,624,808
4,624,809
25 4,624,810
29.5 4,624,811
63 4,624,812
137 4,624,813
4,624,814
162 4,624,815
210.7 4,624,816
225 4,624,817
255 4,624,818
510 4,624,819
512 4,624,820
532 4,624,821
544 4,624,822
569 4,624,823

CLASS 269

71 4,624,451

CLASS 270

95 4,624,452

CLASS 271

4 4,624,453
30.1 4,624,454
85 4,624,455
103 4,624,456

CLASS 272

118 4,624,457
145 4,624,458

CLASS 273

143 R 4,624,459
167 H 4,624,460
184 B 4,624,461
237 4,624,462
246 4,624,463
280 4,624,464

CLASS 277

34 4,624,465

CLASS 279

1 R 4,624,466

CLASS 280

40 4,624,467
43.2 4,624,468
112 A 4,624,469
279 4,624,470
411 R 4,624,471
420 4,624,472
612 4,624,473
4,624,474
618 4,624,475
707 4,624,476
4,624,477
4,624,478
808 4,624,479

CLASS 281

49 4,624,480

CLASS 282

11.5 A 4,624,481

CLASS 283

62 4,624,482

CLASS 284

129 4,625,027

CLASS 285

24 4,624,483
45 4,624,484
47 4,624,485
55 4,624,486
197 4,624,487
334 4,624,488
382 4,624,489

CLASS 290

40 B 4,625,123
42 4,625,124
52 4,625,125

CLASS 292

92 4,624,490
201 4,624,491
263 4,624,492

CLASS 293

136 4,624,493

CLASS 294

26 4,624,494
31.2 4,624,495
148 4,624,496

CLASS 296

1 S 4,624,497
65 R 4,624,498
97 H 4,624,499
146 4,624,500
222 4,624,501

CLASS 297

192 4,624,502
452 4,624,503

CLASS 299

18 4,624,504
81 4,624,505

CLASS 303

3 4,624,506
6 C 4,624,507
116 4,624,508

CLASS 307

262 4,625,126
270 4,625,127
310 4,625,128
446 4,625,129
468 4,625,130
540 4,625,131

CLASS 310

13 4,625,132
56 4,625,133
83 4,625,134
156 4,625,135
239 4,625,136
317 4,625,137
320 4,625,138
330 4,625,139

CLASS 312

234.5 4,624,509
252 4,624,510
273 4,624,511
292 4,624,512

CLASS 313

25 4,625,140
4,625,141
346 DC 4,625,142
409 4,625,143
412 4,625,144
413 4,625,145
414 4,625,146
468 4,625,147
485 4,625,148
623 4,625,149

CLASS 315

111.31 4,625,150
241 P 4,625,151
317 4,625,152
370 4,625,153
371 4,625,154
408 4,625,155

CLASS 318

85 4,625,156
443 4,625,157
701 4,625,158
811 4,625,159

CLASS 322

32 4,625,160

CLASS 323

210 4,625,161

CLASS 324

51 4,625,162
103 R 4,625,163
158 F 4,625,164
220 4,625,165
223 4,625,166
235 4,625,167
300 4,625,168
309 4,625,169
4,625,170
312 4,625,171
326 4,625,172
351 4,625,173
426 4,625,174
430 4,625,175
458 4,625,176

CLASS 328

187 4,625,177

CLASS 330

149 4,625,178
286 4,625,179

CLASS 331

2 4,625,180
57 4,625,181
107 G 4,625,182
117 R 4,625,183

CLASS 333

150 4,625,184
204 4,625,185
216 4,625,186
237 4,625,187
257 4,625,188

CLASS 335

10 4,625,189
20 4,625,190
78 4,625,191
216 4,625,192
4,625,193
271 4,625,194

CLASS 337

159 4,625,195
204 4,625,196

CLASS 339

1 L 4,624,513
14 R 4,624,515
40 4,624,516
75 M 4,624,517
97 P 4,624,518
4,624,519
4,624,521
97 R 4,624,520
99 R 4,624,522
176 L 4,624,523
4,624,524
177 R 4,624,525

CLASS 340

347 AD 4,625,197
514 4,625,198
522 4,625,199
596 4,625,200
636 4,625,201
709 4,625,202
750 4,625,203
784 4,625,204
825.66 4,625,205
902 4,625,206

CLASS 342

20 4,625,210
51 4,625,207
4,625,208
169 4,625,209
374 4,625,211

CLASS 343

702 4,625,212
715 4,625,213
756 4,625,214

CLASS 346

25 4,625,215
76 L 4,625,217
76 PH 4,625,216
4,625,218
108 4,625,219
140 R 4,625,220
4,625,221
160 4,625,222

CLASS 350

3.72 4,624,526
6.5 4,624,527
6.7 4,624,528
96.23 Re.32,293
334 4,624,529
336 4,624,530
340 4,624,531
349 4,624,532
354 4,624,533
358 4,624,534
414 4,624,535
423 4,624,536
531 4,624,537
620 4,624,538
632 4,624,539

CLASS 354

21 4,624,540
83 4,624,541
152 4,624,542

CLASS 355

3 BE 4,624,549
3 DD 4,624,545
3 R 4,624,543
4,624,544
14 D 4,624,548
4,624,559
14 E 4,624,547
14 R 4,624,546
27 4,624,560
40 4,624,550
53 4,624,551
55 4,624,552
4,624,553
64 4,624,554
71 4,624,555
75 4,624,556
4,624,557
100 4,624,558

CLASS 356

28.5 4,624,561
73.1 4,624,562
152 4,624,563
243 4,624,564
315 4,624,565
326 4,624,566
335 4,624,567
347 4,624,568
354 4,624,569
373 4,624,570
406 4,624,571
418 4,624,572
445 4,624,573

CLASS 357

17 4,625,223
23.7 4,625,224
30 4,625,225
4,625,226
68 4,625,227
70 4,625,228
81 4,625,229

CLASS 358

11 4,625,230
22 4,625,231
23 4,625,232
28 4,625,233
78 4,625,234

86 4,625,235
98 4,625,236
106 4,625,237
139 4,625,238
140 4,625,239
143 4,625,240
147 4,625,241
209 4,625,242
229 4,625,243
335 4,625,244

CLASS 360

40 4,625,245
62 4,625,246
71 4,625,247
96.5 4,625,248
104 4,625,249
121 4,625,250
130.21 4,625,251
4,625,252
132 4,625,253

CLASS 361

16 4,625,254
91 4,625,255
117 4,625,256
212 4,625,257
321 4,625,258
340 4,625,259
386 4,625,260
433 4,625,261

CLASS 362

26 4,625,262
32 4,625,263
72 4,625,264
80 4,625,265
146 4,625,266
150 4,625,267
352 4,625,268

CLASS 363

35 4,625,269
39 4,625,270
49 4,625,271
81 4,625,272

CLASS 364

200 4,625,273
4,625,274
401 4,625,275
408 4,625,276
416 4,625,277
417 4,625,278
426 4,625,279
431.02 4,625,280
431.03 4,625,281
466 4,625,282
487 4,625,283
509 4,625,284
513 4,625,285
513.5 4,625,286
4,625,287
521 4,625,288
522 4,625,289
4,625,290
550 4,625,291
569 4,625,292
606 4,625,293
900 4,625,294
4,625,295
4,625,296

CLASS 365

39 4,625,297
189 4,625,299
190 4,625,298
205 4,625,300
222 4,625,301

CLASS 366

13 4,624,574
16 4,624,575
63 4,624,576
83 4,624,577

CLASS 367

24 4,625,302

CLASS 368

10 4,624,578
88 4,624,579
134 4,624,580
282 4,624,581

CLASS 369

45 4,625,303
75.2 4,625,304

CLASS 370

1 4,625,305
60 4,625,306
85 4,625,307
104 4,625,308

CLASS 371

12 4,625,309
15 4,625,310
4,625,311
16 4,625,312
20 4,625,313
68 4,625,314

CLASS 372

38 4,625,315
74 4,625,316
88 4,625,317

CLASS 374

181 4,624,582

CLASS 375

46 4,625,318
61 4,625,319
76 4,625,320
116 4,625,321

CLASS 376

204 4,624,824
227 4,624,825
327 4,624,826
333 4,624,827
421 4,624,828
448 4,624,829

CLASS 377

58 4,625,322

CLASS 378

82 4,625,323
130 4,625,324
168 4,625,325

CLASS 379

28 4,625,077
77 4,625,079
88 4,625,081
104 4,625,080
145 4,625,078
273 4,625,082
389 4,625,083
412 4,624,514

CLASS 381

17 4,625,326
49 4,625,327
111 4,625,328

CLASS 382

1 4,625,329
27 4,625,330

CLASS 384

105 4,624,583
114 4,624,584
296 4,624,585
307 4,624,586

CLASS 400

83 4,624,587
105 4,624,588
124 4,624,589
134.6 4,624,590
171 4,624,591
208 4,624,592
702 4,624,593

CLASS 401

176 4,624,594

CLASS 402

34 4,624,595

CLASS 403

4 4,624,596
16 4,624,597
24 4,624,598
178 4,624,599

CLASS 404

6 4,624,600
12 4,624,601
94 4,624,602

CLASS 405

49 4,624,603
128 4,624,604
144 4,624,605
225 B1 4,275,974
269 4,624,606

CLASS 408

1 R 4,624,607
56 4,624,608

CLASS 409

96 4,624,609
132 4,624,610

CLASS 414

9 4,624,613
14 4,624,611
18 4,624,612
95 4,624,614
97 4,624,615
129 4,624,616
347 4,624,617
420 4,624,618
537 4,624,619
607 4,624,620
735 4,624,621

CLASS 415

14 4,624,622

CLASS 416

19 4,624,623
87 4,624,624

CLASS 417

20 4,624,625
87 4,624,626
199 A 4,624,627
393 4,624,628
407 4,624,629

CLASS 418

63 4,624,630

CLASS 419

7 4,624,830
20 4,624,831

CLASS 420

442 4,624,832
490 4,624,833

CLASS 422

90 4,624,834
102 4,624,835
115 4,624,836

CLASS 423

215.5 4,624,837
226 4,624,838
228 4,624,839
235 4,624,840
359 4,624,841
360 4,624,842
493 4,624,843
593 4,624,844
633 4,624,845

CLASS 424

1.1 4,624,846
15 4,624,847
22 4,624,848
78 4,624,849
89 4,624,850
128 4,624,851

CLASS 426

61 4,624,853
233 4,624,854
501 4,624,855
549 4,624,856

CLASS 427

8 4,624,857
38 4,624,858
4,624,859
46 4,624,860
65 4,624,861
74 4,624,862
84 4,624,863
89 4,624,864
126.2 4,624,865
190 4,624,866
255.6 4,624,867
384 4,624,868
385.5 4,624,869
387 4,624,870
431 4,624,871

CLASS 428

1 4,624,872
36 4,624,873
4,624,874
41 4,624,875
65 4,624,876
71 4,624,877
95 4,624,878
102 4,624,879
143 4,624,880
207 4,624,881
210 4,624,882
212 4,624,883
218 4,624,884
222 4,624,885
245 4,624,886
256 4,624,887
262 4,624,888
264 4,624,889
290 4,624,890
321.3 4,624,891
323 4,624,892
327 4,624,893
328 4,624,894
335 4,624,895
355 B1 4,396,675
428 4,624,896
432 4,624,897
446 4,624,898
447 4,624,899
4,624,900
469 4,624,901

CLASS 429

218 4,624,902

CLASS 430

14 4,624,903
59 4,624,904
65 4,624,905
84 4,624,906
106 4,624,907
192 4,624,908
4,624,909
203 4,624,910
251 4,624,911
258 4,624,912
382 B1 4,273,861
444 4,624,913
495 4,624,914

CLASS 431

9 4,624,631
77 4,624,632
320 4,624,633

CLASS 432

17 4,624,634
58 4,624,635
78 4,624,636
239 4,624,637
253 4,624,638

CLASS 433

56 4,624,639
71 4,624,640

CLASS 434

21 4,624,641
274 4,624,642

CLASS 435

4 4,624,915
7 4,624,916
68 4,624,917
4,624,918
74 4,624,919
142 4,624,920
172.2 4,624,921
172.3 4,624,922
176 4,624,923
220 4,624,924
240 4,624,925
253 4,624,926

CLASS 436

16 4,624,927
179 4,624,928
4,624,929
500 4,624,930
528 4,624,931
538 4,624,932

CLASS 440

2 4,624,643
49 4,624,644

CLASS 441

4 4,624,645
76 4,624,646

CLASS 446

120 4,624,647
176 4,624,648
482 4,624,649

CLASS 455

35 4,625,331
67 4,625,332
612 4,625,333

CLASS 464

26 4,624,650

CLASS 474

13 4,624,651
135 4,624,652

CLASS 493

127 4,624,653
194 4,624,654

CLASS 494

20 4,624,655

CLASS 501

3 4,624,933
17 4,624,934
134 4,624,935

CLASS 502

65 4,624,936
180 4,624,937
208 4,624,938
210 4,624,939
251 4,624,940
302 4,624,941
330 4,624,942

CLASS 514

8 B1 4,430,328
11 4,624,943
12 4,624,944
30 4,624,945
77 4,624,852
4,624,946
108 4,624,947
206 4,624,948
222 4,624,949
4,624,950
234 4,624,951
252 4,624,952
255 4,624,953
290 4,624,954
293 4,624,955
301 4,624,956
327 4,624,957
341 4,624,958
346 4,624,959
401 4,624,960
403 4,624,961
412 4,624,962
418 4,624,963
539 4,624,964
619 4,624,965
724 4,624,966
785 B1 4,405,641

CLASS 518

700 4,624,967
707 4,624,968

CLASS 521

60 4,624,969
131 4,624,970

CLASS 522

37 4,624,971

CLASS 523

136 4,624,972
221 4,624,973
414 4,624,974
453 4,624,975

CLASS 524

13 4,624,976
80 4,624,761
87 4,624,977
104 4,624,978
140 4,624,979
238 4,624,980
326 4,624,981
446 4,624,982
474 4,624,983
541 4,624,984
803 4,624,985

CLASS 525

67 4,624,986
84 4,624,987
151 4,624,988
187 4,624,989
199 4,624,990
209 4,624,991
257 4,624,992
388 4,624,993
440 4,624,994
452 4,624,995
453 4,624,996
471 4,624,997
476 4,624,998
509 4,624,999
534 4,625,000

CLASS 526

88 4,625,001
90 4,625,002
119 4,625,003
262 4,625,004
273 4,625,005
279 4,625,006
4,625,007
283 4,625,008
307.5 4,625,009

CLASS 528

14 4,625,011
28 4,625,012
31 4,625,010
172 4,625,013

CLASS 530

300 4,625,014
324 4,625,015
338 4,625,016
366 4,624,804
376 4,624,805

CLASS 534

695 4,625,017
724 4,625,018

CLASS 536

6.4 4,625,019
18.2 4,625,020

CLASS 540

230 4,625,021
355 4,625,022
539 4,625,023

CLASS 544

2 4,625,024
53 4,625,025
249 4,625,026
309 4,625,028
4,625,029
358 4,625,030

CLASS 546

14 4,625,031
81 4,625,032
113 4,625,033
152 4,625,034
345 4,625,035

CLASS 548

262 4,625,036
461 4,625,037
570 4,625,038

CLASS 549

214 4,625,039
321 4,625,040
343 4,625,041
401 4,625,042

CLASS 556

442 4,625,043

CLASS 558

277 4,625,044
345 4,625,045
388 4,625,046

CLASS 560

53 4,625,047
166 4,625,048
232 4,625,049
4,625,050
265 4,625,051
335 4,625,052

CLASS 562

401 4,625,053
4,625,054
406 4,625,055
407 4,625,056
470 4,625,057
519 4,625,058
600 4,625,059
607 4,625,060

CLASS 564

103 4,625,061
416 4,625,062
480 4,625,063
486 4,625,064

CLASS 568

27 4,625,065
308 4,625,066
451 4,625,067
454 4,625,068
4,625,069

CLASS 604

23 4,624,656
103 4,624,657
121 4,624,658
4,624,659
136 4,624,660
151 4,624,661
249 4,624,662
250 4,624,663
253 Re.32,294
256 4,624,664
307 4,624,665
366 4,624,666
414 4,624,667
904 4,624,668

CLASS 623

5 4,624,669
6 4,624,670
8 4,624,671
10 4,624,672
16 4,624,673
22 4,624,674

CLASSIFICATION OF DESIGNS

D2—	310	286,820	D7—	13	286,840		435	286,860	D15—	1	286,880		147	286,900		9	286,920
	320	286,821			286,841	D10—	62	286,861		5	286,881		148	286,901			286,921
D6—	335	286,822			286,842	D11—	141	286,862		81	286,882		212	286,902			286,922
	345	286,823		23	286,843		160	286,863		123	286,883		225	286,903		13	286,923
	348	286,824			286,844	D12—	13	286,864		139	286,884		238	286,904			286,924
	363	286,825		52	286,845		91	286,865	D16—	31	286,885		239	286,905		35	286,925
	376	286,827		77	286,846		107	286,866			286,886	D23—	17	286,906		58	286,926
		286,828			286,847		184	286,867			286,887		19	286,907	D32—	15	286,927
	379	286,826		309	286,848			286,868			286,888		139	286,908		25	286,928
	396	286,829		409	286,849		211	286,869			286,889	D24—	33	286,909		53.1	286,929
	405	286,830	D8—	29	286,850		302	286,870			286,890			286,910	D34—	15	286,930
	419	286,831		50	286,851		324	286,871		127	286,891		47	286,911		27	286,931
	425	286,832		90	286,852	D13—	10	286,872	D17—	20	286,892		56	286,912		29	286,932
	429	286,833		98	286,853	D14—	36	286,873	D19—	51	286,893	D25—	74	286,913		31	286,933
	473	286,834		347	286,854			286,874		88	286,894	D26—	3	286,914			286,934
	474	286,835		389	286,855		53	286,875	D20—	8	286,895			286,915			286,935
	484	286,836	D9—	301	286,856			286,876	D21—	27	286,896		72	286,916		43	286,936
	510	286,837		352	286,857		64	286,877		54	286,897		79	286,917			286,937
	524	286,838		370	286,858		94	286,878		63	286,898	D27—	22	286,918	D99—	34	286,938
	546	286,839		434	286,859		109	286,879		143	286,899	D28—	2	286,919		43	286,939

CLASSIFICATION OF PLANTS

P.—	70	5,808		76	5,809		5,810		5,811		89	5,812

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,624,163		4,624,412		4,624,929		4,624,123		4,624,259		4,625,154
	4,624,185		4,624,413		4,624,944		4,624,205		4,624,711		4,430,328
	4,624,193		4,624,418		4,624,945		4,624,254		4,625,100	19 :	4,624,106
	4,624,424		4,624,422		4,624,990		4,624,256	16 :	4,624,196		4,624,197
	4,624,457		4,624,439		4,625,015		4,624,282	17 :	4,624,022		4,624,322
	4,624,563		4,624,443		4,625,035		4,624,299		4,624,049		4,624,372
	4,624,673		4,624,444		4,625,049		4,624,490		4,624,113		4,624,442
	4,625,128		4,624,449		4,625,050		4,624,538		4,624,167		4,624,448
02 :	4,624,619		4,624,452		4,625,051		4,624,568		4,624,175		4,624,614
04 :	4,624,274		4,624,458		4,625,056		4,624,582		4,624,178		4,624,616
	4,624,297		4,624,462		4,625,065		4,624,690		4,624,210	20 :	4,624,241
	4,624,323		4,624,495		4,625,070		4,624,725		4,624,225		4,624,445
	4,624,496		4,624,510		4,625,072		4,624,727		4,624,239		4,624,447
	4,624,590		4,624,517		4,625,073		4,624,878		4,624,255		4,624,789
	4,625,077		4,624,519		4,625,075		4,624,958		4,624,280		4,625,091
	4,625,206		4,624,528		4,625,080		4,624,978		4,624,285	21 :	4,624,162
	4,625,312		4,624,529		4,625,081		4,624,993		4,624,345		4,624,195
	4,625,320		4,624,543		4,625,096		4,625,034		4,624,357		4,624,269
05 :	4,624,041		4,624,544		4,625,109		4,625,041		4,624,363		4,624,270
06 :	Re.32,294		4,624,557		4,625,126		4,625,282		4,624,370		4,624,276
	4,624,015		4,624,560		4,625,127		4,625,307		4,624,374		4,624,773
	4,624,016		4,624,566		4,625,130	10 :	4,624,300		4,624,414	22 :	4,624,130
	4,624,046		4,624,567		4,625,135		4,624,655		4,624,446		4,624,148
	4,624,079		4,624,569		4,625,150		4,624,821		4,624,455		4,624,306
	4,624,092		4,624,573		4,625,158		4,624,988		4,624,468		4,624,438
	4,624,109		4,624,583		4,625,162		4,624,989		4,624,480		4,625,068
	4,624,126		4,624,593		4,625,183	12 :	4,624,040		4,624,482		4,625,173
	4,624,129		4,624,600		4,625,193		4,624,068		4,624,492	23 :	4,624,744
	4,624,143		4,624,617		4,625,207		4,624,082		4,624,500	24 :	4,624,112
	4,624,155		4,624,627		4,625,208		4,624,110		4,624,541		4,624,393
	4,624,157		4,624,633		4,625,231		4,624,124		4,624,558		4,624,766
	4,624,169		4,624,639		4,625,240		4,624,206		4,624,618		4,625,245
	4,624,173		4,624,641		4,625,246		4,624,211		4,624,659		4,625,271
	4,624,181		4,624,662		4,625,257		4,624,272		4,624,667		4,625,308
	4,624,238		4,624,663		4,625,259		4,624,383		4,624,806	25 :	4,624,051
	4,624,243		4,624,681		4,625,273		4,624,395		4,624,982		4,624,077
	4,624,245		4,624,684		4,625,278		4,624,426		4,624,994		4,624,086
	4,624,246		4,624,691		4,625,311		4,624,511		4,625,099		4,624,140
	4,624,252		4,624,728		4,625,317		4,624,576		4,625,116		4,624,207
	4,624,258		4,624,732		4,625,319		4,624,578		4,625,133		4,624,248
	4,624,318		4,624,753		4,625,332		4,624,579		4,625,160		4,624,337
	4,624,321		4,624,754	08 :	4,624,055		4,624,670		4,625,274		4,624,417
	4,624,328		4,624,755		4,624,235		4,624,721		4,625,281		4,624,427
	4,624,341		4,624,780		4,624,302		4,624,738	18 :	4,624,120		4,624,433
	4,624,378		4,624,808		4,624,470		4,624,749		4,624,320		4,624,502
	4,624,384		4,624,826		4,624,481		4,624,995		4,624,338		4,624,513
	4,624,388		4,624,842		4,625,176		4,625,119		4,624,463		4,624,586
	4,624,390		4,624,847		4,625,215		4,625,198		4,624,539		4,624,638
	4,624,396		4,624,863		4,625,217		4,625,275		4,624,836		4,624,640
	4,624,397		4,624,901		4,625,222		4,625,276		4,624,895		4,624,657
	4,624,402		4,624,916		4,625,295		4,625,280		4,624,983		4,624,665
	4,624,405		4,624,918	09 :	4,624,039		4,625,290		4,625,074		4,624,677
	4,624,411		4,624,921		4,624,083	13 :	4,624,240		4,625,134		4,624,679

4,624,852
4,624,928
4,625,007
4,625,014
4,625,026
4,625,045
4,625,093
4,625,115
4,625,140
4,625,141
4,625,164
4,625,169
4,625,203
4,625,292
4,625,318
26 : Re.32,296
4,624,042
4,624,098
4,624,117
4,624,131
4,624,139
4,624,149
4,624,168
4,624,229
4,624,290
4,624,291
4,624,334
4,624,336
4,624,347
4,624,348
4,624,352
4,624,493
4,624,499
4,624,523
4,624,524
4,624,570
4,624,585
4,624,610
4,624,649
4,624,714
4,624,757
4,624,758
4,624,759
4,624,862
4,624,915
4,624,969
4,624,986
4,624,998
4,625,011
4,625,028
4,625,031
4,625,044
4,625,084
4,625,090
4,625,265
4,625,267
27 : 4,624,026
4,624,027
4,624,060
4,624,137
4,624,251
4,624,266
4,624,356
4,624,521
4,624,564
4,624,602
4,624,661
4,624,669
4,624,713
4,624,889
4,624,999
4,625,069
4,625,087
4,625,123
4,625,175

4,625,315
4,396,675
28 : 4,624,057
29 : 4,624,376
4,624,408
4,624,609
4,624,615
4,624,644
4,624,652
4,624,685
4,624,937
31 : 4,624,033
32 : 4,624,278
4,624,436
4,624,459
33 : 4,624,456
4,624,882
4,625,163
4,625,195
4,625,248
34 : Re.32,295
4,624,036
4,624,067
4,624,099
4,624,111
4,624,253
4,624,264
4,624,294
4,624,364
4,624,366
4,624,398
4,624,415
4,624,425
4,624,434
4,624,441
4,624,515
4,624,520
4,624,522
4,624,656
4,624,666
4,624,674
4,624,695
4,624,734
4,624,763
4,624,764
4,624,765
4,624,772
4,624,774
4,624,776
4,624,791
4,624,810
4,624,812
4,624,838
4,624,840
4,624,846
4,624,856
4,624,868
4,624,872
4,624,898
4,624,902
4,624,908
4,624,925
4,624,939
4,624,940
4,624,954
4,624,955
4,624,964
4,624,967
4,624,968
4,624,996
4,624,997
4,625,012
4,625,016
4,625,018
4,625,022

4,625,023
4,625,038
4,625,039
4,625,055
4,625,060
4,625,071
4,625,078
4,625,114
4,625,120
4,625,138
4,625,157
4,625,182
4,625,201
4,625,205
4,625,214
4,625,233
4,625,235
4,625,270
4,625,296
35 : 4,624,028
4,624,736
4,625,316
36 : 4,624,018
4,624,030
4,624,072
4,624,084
4,624,087
4,624,088
4,624,094
4,624,128
4,624,184
4,624,244
4,624,263
4,624,275
4,624,287
4,624,342
4,624,375
4,624,428
4,624,430
4,624,432
4,624,451
4,624,514
4,624,532
4,624,553
4,624,556
4,624,598
4,624,604
4,624,642
4,624,654
4,624,680
4,624,682
4,624,701
4,624,705
4,624,708
4,624,724
4,624,741
4,624,751
4,624,815
4,624,818
4,624,851
4,624,876
4,624,926
4,624,931
4,624,932
4,624,933
4,624,965
4,624,970
4,624,979
4,625,000
4,625,013
4,625,020
4,625,037
4,625,040
4,625,132
4,625,165

4,625,197
4,625,242
4,625,244
4,625,293
4,625,321
4,625,323
37 : 4,624,029
4,624,070
4,624,102
4,624,115
4,624,158
4,624,198
4,624,200
4,624,242
4,624,471
4,624,798
4,624,865
4,625,092
4,625,294
38 : 4,624,176
4,624,497
4,624,779
39 : 4,624,038
4,624,125
4,624,223
4,624,277
4,624,301
4,624,303
4,624,359
4,624,386
4,624,389
4,624,391
4,624,467
4,624,509
4,624,672
4,624,689
4,624,693
4,624,710
4,624,718
4,624,722
4,624,731
4,624,733
4,624,761
4,624,762
4,624,775
4,624,814
4,624,828
4,624,849
4,624,860
4,624,869
4,625,002
4,625,101
4,625,213
4,625,324
40 : 4,624,093
4,624,308
4,624,312
4,624,313
4,624,316
4,624,317
4,624,379
4,624,483
4,624,704
4,275,974
41 : 4,624,188
4,624,204
4,624,295
4,624,380
4,624,620
4,624,635
4,624,648
4,624,748
4,625,202
4,625,238
4,625,288

4,625,313
42 : 4,624,021
4,624,056
4,624,073
4,624,091
4,624,144
4,624,147
4,624,160
4,624,180
4,624,191
4,624,213
4,624,292
4,624,400
4,624,431
4,624,512
4,624,575
4,624,599
4,624,636
4,624,700
4,624,703
4,624,707
4,624,790
4,624,796
4,624,827
4,624,829
4,624,844
4,624,848
4,624,861
4,624,866
4,624,942
4,624,943
4,625,004
4,625,047
4,625,088
4,625,089
4,625,098
4,625,155
4,625,190
4,625,237
4,625,268
4,625,279
45 : 4,624,116
4,624,597
4,624,694
4,624,793
4,624,813
4,624,980
4,625,029
46 : 4,624,189
47 : 4,624,054
4,624,192
4,624,304
4,624,472
48 : Re.32,292
4,624,052
4,624,062
4,624,069
4,624,101
4,624,136
4,624,219
4,624,247
4,624,260
4,624,307
4,624,309
4,624,310
4,624,311
4,624,315
4,624,329
4,624,367
4,624,469
4,624,484
4,624,485
4,624,488
4,624,591
4,624,592

4,624,645
4,624,683
4,624,726
4,624,771
4,624,795
4,624,805
4,624,835
4,624,837
4,624,839
4,624,938
4,624,957
4,624,972
4,624,975
4,625,110
4,625,111
4,625,179
4,625,200
4,625,260
4,625,286
4,625,300
4,625,301
4,625,310
49 : 4,624,783
4,624,787
4,624,885
4,625,289
50 : 4,624,236
4,624,740
51 : 4,624,142
4,624,145
4,624,333
4,624,561
4,624,572
4,624,739
4,624,742
4,624,817
4,624,824
4,624,888
4,624,961
4,625,106
53 : 4,624,043
4,624,085
4,624,141
4,624,327
4,624,410
4,624,450
4,624,588
4,624,653
4,624,743
4,624,745
4,624,877
4,625,095
4,625,167
4,625,209
4,625,277
54 : 4,624,671
4,624,706
4,625,030
55 : 4,624,095
4,624,096
4,624,161
4,624,332
4,624,464
4,624,494
4,624,533
4,624,626
4,624,712
4,624,716
4,624,811
4,624,853
4,624,984
4,625,189
4,625,196
4,625,283

DESIGN PATENTS

01 : 286,827
286,828
06 : 286,830
286,835
286,852
286,860
286,869
286,870
286,874
286,879
286,892
286,895

286,904
286,925
286,926
08 : 286,832
09 : 286,836
286,919
286,923
286,924
286,936
11 : 286,843
12 : 286,826
286,863

286,871
286,913
13 : 286,884
17 : 286,837
286,849
286,857
286,939
19 : 286,917
21 : 286,845
24 : 286,918
25 : 286,853
286,932

26 : 286,833
286,865
286,897
286,931
27 : 286,905
286,916
286,933
30 : 286,838
33 : 286,821
34 : 286,840
286,841
286,842

286,928
36 : 286,829
286,848
286,861
286,887
286,894
39 : 286,880
40 : 286,911
286,935
41 : 286,883
42 : 286,823

286,872
286,914
286,915
286,930
48 : 286,839
286,850
286,855
50 : 286,834
51 : 286,881
53 : 286,912
55 : 286,864

PLANT PATENTS

06 : 5,809

5,810

5,811

42 : 5,812

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